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Old Series, Vol. XIX. No. 29



Plate 527 E.

High Grade Enamelled Iron Ware

Enamelled Iron 30 x 20 inch Roll Rim
Kitchen Sink, Integral back, apron,
and Drain board.

Superior Solid Porcelain Ware

Royal Porcelain 48 x 18 inch Pantry
Sink, Double Drain Board.

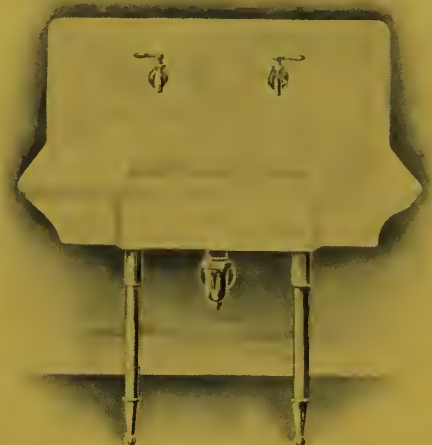


Plate 529 E.

Unsurpassed range, careful attention and prompt shipment, do these features
appeal to you Mr. Plumber ?

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

The James Robertson Company
LIMITED

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opening of their

**NEW SANITARY
EXHIBITION ROOMS**

AT

**66 Beaver Hall Hill
MONTREAL**

We cordially invite you to visit
this Exhibition and inspect our
extensive range of the finest
examples of Modern Sanitary
Appliances.



METROPOLITAN CLOSET OUTFIT

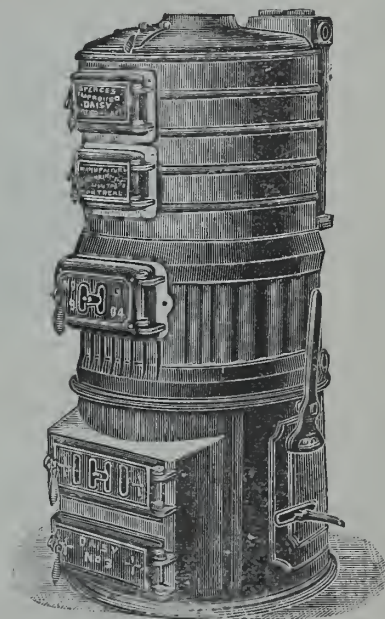
BEST COMBINATION
IN THE WORLD.

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Why You Should Sell The Daisy

- ¶ *Because the quality of material used in the manufacture of the Daisy is the best procurable.*
- ¶ *Because every part is accurately finished and thoroughly tested and you are not required to tear down your work to remove defective parts.*
- ¶ *Because it is the most self-contained and easily erected boiler on the market.*
- ¶ *Because once the Daisy is properly installed no further time is required to care for it.*



Write for Catalogue

CLUFF BROTHERS

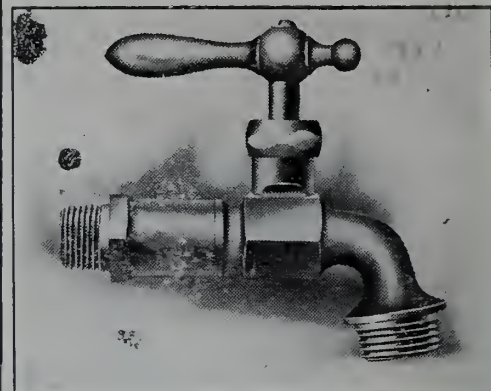
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Selling Agents for

WARDEN KING & SON, Limited



A GOOD RESOLUTION FOR 1908



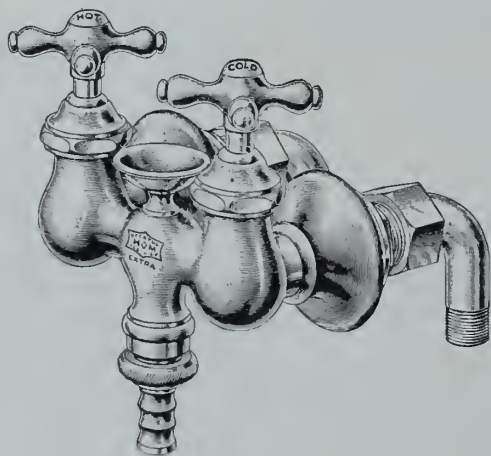
That whereas the **"Monarch" Cocks and Valves** are fully tried and tested and are therefore thoroughly reliable assuring a satisfactory job which is of very great value:

Resolved—We the individual **Plumbers** and **Steamfitters** of the **Dominion of Canada** hereby decide to make the **Brass Goods** manufactured by the **Monarch** Company our standard installation for 1908.

The Monarch Brass Mfg. Co., Limited

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Factory
Port Colborne, Ont.



Mueller Double Compression Bath Cocks

A good apple is sound all the way through to the core—
not specked with rot on one side and firm on the other.

Sound to the Core

Mueller Double Compression Bath Cocks are sound to the core because the core is properly placed to provide an equal distribution of the best flawless red brass and to make smooth and regular waterways.

The smooth casting readily takes the Mueller Extra heavy Nickel Plating which retains its luster under service.

Unconditionally Guaranteed. Prices upon application.

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254 Canal St., Cor. Lafayette.

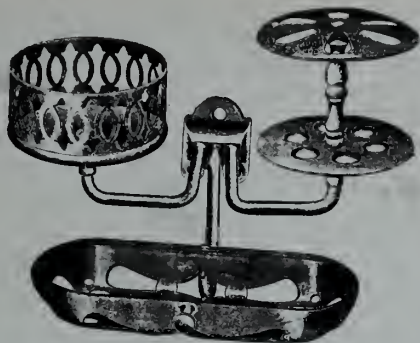
Works and General Office,
DECATUR, ILL.
West Cerro Gordo St.

GOOD BATH ROOM FIXTURES

THIS IS A
FAVORITE

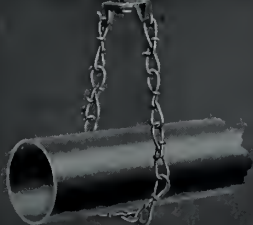
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The CARRIAGE MOUNTINGS CO., Ltd.
NIAGARA FALLS CANADA



NIAGARA CHAIN for PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.



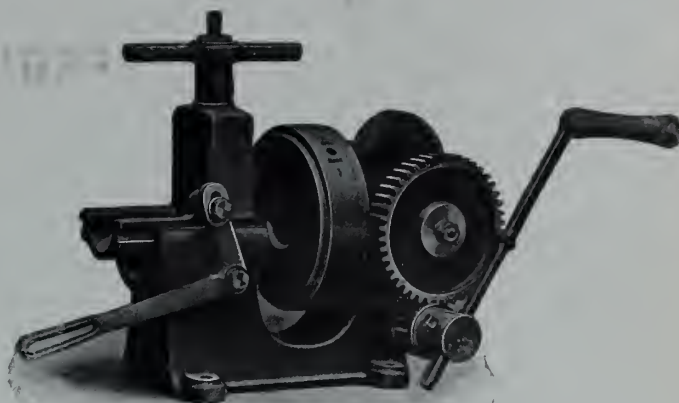
Pipe may be hung any distance from ceiling with this hanger. Permits of easy and exact adjustment.

Write for samples and prices.

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WINN'S PIPE FITTER'S SCREWING MACHINE

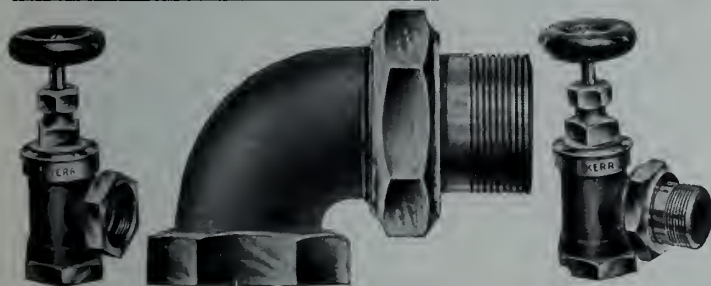
New Model Fig. 1027

This screwing machine has been designed to meet the demand for a lighter and cheaper tool, suitable for sending out to jobs, and embodies the labour-saving features of the more expensive machines as far as is possible at the price, but the necessary economy has been effected without prejudice to strength and durability, the best material being used throughout.

Price £10 : 10 : 0 complete

With Adjustable Four-chaser Dies.

To screw tubes $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ 1 $1\frac{1}{4}$ $1\frac{1}{2}$ 2 inch, also Bends $1\frac{1}{2}$ $1\frac{3}{4}$ & 2 inch
LIGHT AND STRONG. Write for Full Particulars.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

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THE KERR ENGINE CO.
Valve Manufacturers
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PLUMBERS

WILL YOU INCREASE
YOUR KNOWLEDGE ?

J. J. Cosgrove's Book
PRINCIPLES AND PRACTICE
OF PLUMBING

will be sent you POSTPAID on RECEIPT of \$3.00. This is the most complete treatise ever written or published on plumbing and sanitation, giving rules and formulas for doing work on an exact scientific basis instead of by "guessing," and covers the sanitary requirements of all classes and sizes of buildings. It is a RAPID SELLER because it is a practical book for practical men.

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co.

10 Front St. E., Toronto

Healthy and Diseased Plumbing

An address by Henry B. Davis, President of American Society of Inspectors of Plumbing and Sanitary Engineers, before the Homoeopathic Medical Society of Washington, D.C.

At no time in the history of plumbing and sanitation has there been more thought and study given, or has there been in the past such advancement in regard to sewage disposal and the water supply system; such watchfulness of water pollution, or more progress made in scientific consideration of plumbing construction and fixture manufacture as is now taking place, and will continue in the future.

This awakening is due to the epidemics of disease in various localities that can be attributed to contaminated water supply and faulty drainage systems, and has caused action to be taken by legislatures of nearly all states passing laws requiring the Boards of Health to guard the water supply of cities and prevent the pollution of streams by sewage and drainage from villages and towns when used by other cities for water supply; also requiring the installation of adequate sewage disposal and water supply systems to care for each city or town, and the placing of modern plumbing within the houses under competent inspection, relegating to oblivion the sacred town pump; the disease breeding, leaking privies, cesspools and contaminated wells. The numerous instructive articles appearing in magazines and books devoted to plumbing and sanitation, and the work of the associations, societies and manufacturers of plumbing goods are all contributing advanced ideas for greater improvements in fixtures and plumbing construction. Credit is due the manufacturer because he is constantly on the alert to place on the market the latest design in sanitary invention, and because he is contributing to the education of the public generally by the distribution of thousands of expensive catalogues showing modern non-absorbent plumbing goods made of glazed earthen ware, vitreous china and enameled iron.

Manufacturers Are Progressive.

The enameled iron fixtures are proving very satisfactory and are cheaper for tubs, lavatories and sinks than either of the two other materials, and with care will last for years. The advancement in fixture designs makes it possible with small outlay of cash for an owner to remove the old copper-lined tub, usually patched, depressed and leaking; also the straight hopper pan or plunger water closet, used in the past, with all their defects, such as fouling surfaces, inclosures which absorb urine, waste water, filth, and which offers harbor for vermin and refuse. The doing away with these unsanitary fixtures also removes the obnoxious lead safe under them, which retained stagnant water and slops that give off odors because inaccessible for cleaning. These old fixtures were usually placed in the cellar or improperly lighted and poorly ventilated rooms, and were certainly objects to keep out of sight. In their place we have now the use of non-absorbent open plumbing fixtures, free from woodwork, placed in toilet rooms

which are well lighted, heated and ventilated and having tile floors and walls, and occupying a prominent and convenient position in the house, where the sun, air and a little work will keep them in a sanitary condition. Such a change is as great as that of a ride in the old-fashioned, slow-moving horse car compared with the rapid moving electric propelled and heated car.

Faults to Be Avoided.

While the fixture makers have made great strides, the important and vital parts of plumbing construction—namely, the cast iron pipe and fittings and the brass traps and waste fixtures are not keeping up with the march of progress. This is due no doubt to great competition in trade, and manufacturers are taking liberties that are close to the danger line, especially with the cast iron pipe and fitting, which are found in many cases to be of low grade material, roughly finished, irregular in thickness and light in weight, and the makers of nickel plated brass traps and waste fixtures are making them of nickel plated iron, which rust at threads and when of brass thin gauge metal is used, so that it is almost impossible to cut a thread on these pipes without cutting through the metal, and there have been any number of cases where the pipe has been so weakened by cutting the thread that any undue strain pulls it apart. It is here that it is the duty of those whose knowledge makes them familiar with the weak spots of plumbing construction to prohibit such work. The American Society of Inspectors of Plumbing and Sanitary Engineers are testing and working to establish a standard weight and thickness of all material used in the making of these goods. It is the hope of this society to also bring about uniform plumbing laws to govern plumbing installation and the appointment of inspectors of plumbing to see that the work is properly performed.

To guard against this defective material, being used now, this duty falls properly upon the inspector of plumbing and his assistants. He must see that all pipes used are of proper size, weight and thickness as prescribed by most plumbing regulations, and that a sewer is of ample size and has the required minimum fall of $\frac{1}{4}$ -in. to the foot, is laid straight, or with as few bends as possible to outlets for stacks, and with trapped outlets for area and yard drains and down-spout terminals; that all the joints in cast iron pipe were well calked with lead and oakum; that no cracked pipe or fittings have been used or doctored, as is the habit with some journeymen plumbers unless they are watched, and last, to be reasonably sure there are no leaks.

Progressive Tests of Work.

This is determined by a water test on the sewer from its connection with the public sewer to the terminal in the yard, under a head of water of at least

5 feet, and the sewer is not permitted to be covered until this test is made under inspection and the work passed by the inspector of plumbing or his assistant. After the sewer is laid the work of roughing in begins, such as running soil and vent stacks and the waste and vent pipes for small fixtures. When finished the outlets are plugged or sealed and an air test applied under inspection and finally when the entire work is completed a smoke or peppermint test is applied to the entire plumbing system and the work not passed by the inspector of plumbing or his assistant or certificate issued by the chief inspector of plumbing until all piping and fixture connections are perfectly tight and in accordance with the plumbing regulations.

The Running Trap Question.

The next subject of importance is the running trap and fresh air inlet, which is placed on a house sewer at the curb or in the parking, to prevent the public sewer air and gases from entering the house sewer and house through some unsealed fixture trap. This is accomplished by the deep water seal of the trap. The running trap on a sewer can be likened to the veriform appendix in the human body, for its use to a sewer is as much a matter of doubt and controversy among sanitarians as the appendix is among physicians, and, like that appendage, it is often removed without detriment to the system. The articles which have been written pro and con for years on this subject, if compiled, would make a good sized book. The object of the fresh air inlet is to provide a circulation of air down the inlet pipe to and through the house sewer, up the soil stack to circulate air to the small vent and waste line and out vent stack to the roof, and to accelerate this movement of the air the soil and vent stack are required to be placed within the house where the house temperature imparts its warmth to the pipes. The upward movement of the air, however, is often reversed, especially during a hard wind or rainstorm, and frequently when a large fixture is discharged, then the fresh air inlet contradicts its name and becomes a foul air outlet, and the odors manifest themselves in a disagreeable manner at times particularly during the summer, when one is sitting near this opening. The principal objections to a running trap are the fact it is often the cause of obstructed house sewers, due to careless occupants and servants throwing rags, broken bottles, small cans and even scrub brushes and other things into water closets, which in some inexplicable manner get by the fixture trap and eventually lodge in the running trap. A sewer with or without a running trap will not carry off any and everything, but with a running trap a sewer will act properly for years with care, and to my mind is an additional safeguard to the occupants.

(Concluded in next issue).

Letters to the Editor

PLUMBERS' RELATION TO STAFF

Editor Plumber and Steamfitter,—Ever since necessity invented the plumber, he has been valued to an extent that only necessity could afford. In his place he is indispensable, he is worth his price at all times when his work is good, he is the sentinel upon whom his fellow subjects look to to devise, promote and develop means of executing work, reflecting his skill and giving satisfaction and comfort to them. This, I think, is the text of the constitution of the Master Plumbers' Association, which appeals to all sane, progressive men.

The prospect of working out this condition is ever brightening, whether it applies to the Jap or to the Cockney. The necessity of keeping clean, is no more so than having clean, wholesome dwellings, they are interwoven, the presence of one is the companion of the other.

To me, then, the duty and policy of the master plumber is as plain as the streams of emigration at the gates of the east and the west, his duty to the state should direct him to use his influence against over-crowded and unsanitary dwellings, his policy as a business man should be to get a profitable price for his labor, the margin of profit is a point that he alone is qualified to determine, owing to the conditions which may be peculiar to his business. There is a distinction which should have no difference in the whole of Canada, every master plumber should stick it in his shop: "Value for value—a dollar's worth for a dollar."

Your reader may think this meaningless, hollow talk, but I am treating him seriously. Can he give a just return to himself or his customer if he is employing a careless or an incompetent man, who arrogantly assumes the superior rights of his union. If incompetence and its costly results are laid bare in a police court the judgment of the court goes against the boss because he should have been certain of the man's ability before he entrusted him with responsibility. It is patent then that the master plumber alone, is the factor to judge the ability and to adjust the values of those whom he employs.

It is well known that in a big city the open shop or the right to determine a man's worth has been the subject of contention for six months. The matter is, I believe, still unsettled. This right, so essential to the stability and permanence of any business institution, admits of no argument with those who by organized efforts would strive to wring from the employer the entire fruits of those talents given by a beneficent Creator. The man who defends himself on this ground is usually the sincere respecter of the birthrights of his fellowmen. The right to struggle and the glory to maintain a comfortable position in life appeals to the manhood of the country. It is the breath of humanity. The ill-fitted or the unprepared must not rejoice in their numerical force and exclude thereby those who stand in the world on their individual capacity and character. Variety of thought and the free, intelligent expression of it, disseminates wisdom.

All specialized lines have been developed by the direction of associated knowledge. This is why the plumber, like

his fellowman, stands before society in a collective form prepared to assist its well-being to the best of his ability. With the ever-increasing necessity for the plumber, resource, ingenuity and originality, coupled only with probity of character, will be the attributes only of the successful master plumber. To him competition in a life-giver, it shows his quality teaching him to stand reverses and to stand successes. Each succeeding day has a fairer promise. His loss to-day is to-morrow's gain.

The master plumber, by associating with his fellows, can do his duty to the state. By petitioning the elected authorities to encourage legislation making it imperative that good plumbing must be done. If it need be said, not only to save health, but to save as well property from damage.

If every corporation in the Dominion could be urged by the chairman of the sanitary committee of the Master Plumbers' Association to introduce such legislation the wheels of industry would have become national, action would be going on new channels of trade, the country would find that in devising means to keep a clean health record, it was paying the best attention to business. The resources of the plumber in his character as a citizen would be applauded, being second to none for its patriotic value. His willing service to the state would be observed and at last his remuneration would be ungrudgingly awarded him.

"X."

Ottawa, December 28, 1907.

SOME RUNNING COMMENTS.

Editor Plumber and Steamfitter,—Making the rounds in my work in northern Ontario, I find the Plumber and Steamfitter of Canada in my grip, and find time to offer a few comments on articles it contains.

First, in reference to Mr. Oldacre's

of the same, to me, is the safest guide in the heating business.

The ill results of the departmental stores selling plumbing goods has been quickly demonstrated. However, it points out the necessity of an organized effort of the trade to protect its legitimate interest in the sale of plumbing goods.

The article against the "Use of the Intercepting Trap," by Mr. Kavanagh, is good. In further reference to this trap, I believe the majority of plumbers are against its use, although we find it a source of profit to install. Nevertheless, if it serves no good purpose, it should be discarded, but who are responsible for their present use? I have frequently noticed that engineers who have charge of the sewer construction in towns, draw up a sewer and plumbing by-law, which is usually adopted, as he is supposed to know, and very frequently they specify an intercepting trap. Town councillors don't know whether it is good or bad. The men of the trade keep mum, and the intercepting trap becomes a regular fixture for the town.

In conclusion, I firmly believe that if the trade is to be raised to the highest possible standard, and the material interest of it protected, that omission rests solely with the men of the trade, individually and collectively working for such improvement.

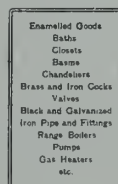
J. E. FARRELL.

North Bay, Dec. 30, 1907.

WELL PRINTED LETTER HEAD.

The letterhead of the Stevenson & Malcolm Co., Guelph, reproduced in the accompanying engraving, has been commended as follows by The Printer and Publisher, the Canadian authority on typography:

"This design has the merit of being business-like and solid, and it is a fair example of correct composition. Whether it might not have been improved on, had the border round the side-



Stevenson & Malcolm Co.

MANUFACTURERS, IMPORTERS AND JOBBERS
IN PLUMBERS', ENGINEERS' AND STEAM FITTERS' GOODS

SHOW ROOMS—78 Wyndham Street

Guelph, Canada

190

A Letterhead That Wins.

article on "Methods of Determining the Amount of Radiation Necessary." In my own experience, architects specify for about two-thirds of the heating figured on, and with a rare exception, the radiation specified is ample, and on the balance I find there is such a terrible divergence in the construction of buildings, that it would be very difficult to apply any hard and fast rule. A good-looking building that looked easy to heat, with plenty of radiation and ample boiler capacity, has fallen below my expectation. Again, a rickety-looking house has been heated to a disagreeable point without any effort. A good practical experience and a close application

piece been heavier, is worth considering. This would have balanced the heavy type in the name and the rule under it."

A regrettable error in the legal reports in several Toronto newspapers a fortnight ago confused the name of the Dominion Radiator Company, Toronto, with that of the Canada Radiator Company, Lachine, Que., in the report of proceedings to enforce a guarantee in favor of the Canada Radiator Company. The former company was in no way connected with the suit being tried in the courts.

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ANOTHER YEAR OPENS.

The publishers of Plumber and Steam-
fitter extend the compliments of the
season to its readers with the wish that
all may enjoy a prosperous 1908.

With all the newspaper talk of dull
times, many have adopted the belief that
disaster is in store for the trade during
the coming year. Caution and retrench-
ment are undoubtedly necessary, but re-
ports received by us from manufactur-
ers and jobbers in all parts of Canada
indicate that the daily newspapers have
decidedly overdone this talk of business
setback. These reports will be published
next week, and, in the meantime, we urge
our readers to continue to pass along
the thought that 1908 is going to be a
much better year than is generally ex-
pected.

WHERE DO YOU STAND?

This is a question for every plumber
to face at the begining of a year's busi-
ness: Do you know where you stand
financially? Have you any definite
statement as to just how much stock
you have packed away in the back
cellar and in the second storey of the
warehouse? Do you know how much
this stuff is really worth?

Here is one point where a great many
plumbers go wrong and get into further
trouble. They neglect to take stock. A
merchant ought to know at least once
a year, and better, every month or
every week, just where he stands. Hun-
dreds of the assignments which occur
could be avoided if this matter were
attended to. Find out what goods you
really have on hand and clear it out be-
fore you let the travelers load you up
with new stock.

And now is the best time of the year
to do this work, in January, the slack
winter month after the holiday rush is
over. The matter is one which can-
not be too strongly emphasized.

MUST FOLLOW ARCHITECT'S SPECIFICATIONS.

An interesting decision by the sup-
reme court of the State of New York
has recently been announced in a suit
brought by a contractor and defended
on the ground of failure to obey the
specifications. In the particular case in
question the architect specified the use
of a certain braided cotton sash cord,
but the contractor substituted some-
thing else which he considered "just as
good," on the ground that he had never
heard of the article in question. In de-
ciding the case the court ruled as fol-
lows:

We have set forth some specimens out
of more than twenty admitted failures
to comply with the specifications and at
the same time have given in substance
the reasons of the contractor for the
omissions. The contract was not
substantially performed in all re-
spects and there was no evi-
dence to support the finding of the trial
court that it was. There is no sub-
stantial performance when no attempt
is made to comply with certain express
requirements of the specifications and
no excuse or explanation is given for
the failure. A contract is not substan-
tially performed by substituting for that
which is expressly required, materials,
methods of workmanship, which, in the
opinion of the contractor and his ex-
perts, are "just as good," unless the

substitution relates to a matter of minor
importance, is made in good faith and
for sufficient reasons, and there is an
adequate allowance for the difference.
The owner has a right to what the con-
tractor agreed to give him, and unless
he has it, or when the failure is neither
wilful nor substantial, is fully com-
pensated for the omission, there is no
substantial performance and there can
be no recovery. It is not sufficient for
the contractor to build a house, but he
must build the house contracted for,
and substantially comply with the speci-
fications as to the method of construc-
tion, materials and workmanship before
he is entitled to payment.

In the case last cited we said: "The
contractor may not deliberately violate
his contract by the use of earthen con-
struction instead of iron and small pipes
instead of large ones, and yet claim
that he has done as he agreed because
the result is just as good. Unless the
owner had the right to contract for what
he wanted and get what he contracted
for, there was no use in making the
contract. A building contract, like any
other, is to fairly perform according to
its terms, and any substantial change,
unless authorized by the owner or archi-
tect, is made at the risk of the con-
tractor. In order to avoid injustice the
law tolerates unsubstantial deviations
made in good faith, but it exacts full
compensation therefor, and permits a
recovery on the theory of substantial
performance only after the proper de-
ductions have been made. The contrac-
tor had no right to substitute his own
judgment for the stipulations of the con-
tract, or to recover on the basis of com-
plete performance, when * * * he
wilfully and intentionally used inferior
and less expensive materials in the place
of those agreed upon."

SUCCESSFUL APPRENTICESHIP SYSTEM.

A significant example of what may be
accomplished by a well-conducted ap-
prenticeship system may be found at the
works of the General Electric Company,
Lynn, Mass. The establishment of this
system has been the outcome of a care-
ful study of existing apprenticeship sys-
tems and their weaknesses. Thirty or
forty years ago, when the entrance upon
a skilled trade was universally achieved
through the door of an apprenticeship, a
boy was apprenticed to a journey-
man who practised the trade in
all its parts. Having a personal
interest in the boy, the journeyman in-
itiated him into the mysteries and arts

of the trade, until the apprentice, after five or six years of tutelage, took and held his place by the side of his master.

The introduction of the factory system and labor unions brought about a change in the condition of the apprentice. As the shop departments grew and a larger percentage of unskilled labor was employed in the factory, the foreman or his assistants felt less inclined and were, in fact, less able to devote special attention to the training of the boy, and then under the rules of the labor unions only a limited number of boys are qualified to serve an apprenticeship. The company, therefore, took the next logical step in the development of apprenticeship systems. It appointed a supervisor of apprentices, and placed him in charge of a special training department for apprentices, where the boys may receive their initial training under expert supervision in a thorough and systematic manner.

Under the system prevailing at Lynu every boy who wishes to learn a trade must serve a trial period of two months in the training room. During that time he is under close observation of the supervisor of apprentices, both as to his mental and moral make-up, and as to his ability for and attitude toward the practical work. Immediately upon entering the training room the young candidate is put at a machine and required to perform useful work. If he proves, during the trial period, that he possesses the right qualifications, he is allowed to sign the regular apprenticeship agreement, which calls for a service of four years for machinists, tool maker and pattern maker apprentices and three years for moulder apprentices.

The apprentice remains in the training-room for a period of about a year and a half to two years, according to his individual ability, and during that time is given an opportunity to work with the different machines and tools, and to perform different operations on a variety of work. At the end of this period he has gained a general knowledge of the trade and an ability for the work which must now be rounded out by a longer experience on a larger variety of work, such as the factory itself offers. The apprentice is, therefore, transferred from the training-room at the end of about two years to different departments of the factory, until at the end of the four years' term he is well qualified to assume a position as regular journeyman at journeyman's wages.

The boys moreover, are taught to instruct others; for the object is to create a supply of skilled mechanics from whom the assistant foreman, foreman, and superintendents of the company may be chosen. Each boy, therefore, must help to break in a less advanced apprentice in one of the operations before he himself may advance to a more difficult task. The regular instructor, however, starts off the team of boy-teacher and boy-pupil, and follows their joint work from time to time throughout the day; this arrangement permits the instructor to supervise a large number of such teams in addition to the regular work of the department. Pedagogically this pupil teacher system

PASS THIS ALONG.

The following practical advice, printed on a card for enclosing in envelopes containing receipts for remittances, issued by the Penton Publishing Company, publishers of the Iron Trade Review, Cleveland, is worthy of being passed along by readers of this paper:

"If all business houses and business men in America will do their level best at this time to pay every bill, large or small, as fast as they can, it will help very materially in the prompt restoration of confidence.

"We are doing all we can to help our customers on the one hand, and on the other, the money you have sent us will be paid out by or before this reaches you.

"This money panic must quickly pass by, and then, with confidence restored, your customers and ours are going to begin to place orders, and the establishments which supply the best goods and seek the hardest for business, will get there first."

is significant; for it tends to throw boys upon their own resources, thereby making them think for themselves; it develops in them the power to impart information and to make others perform the processes which they themselves understand; and, finally, it initiates them into the art of handling work and workmen. A possession of these qualifications determines to a large extent the success of a foreman, superintendent, in fact, any leader of men in whatever walk of life he may be engaged.

METAL MOVEMENTS IN 1907.

The retrospect of the metal markets, which we publish in this issue, shows how severe has been the buffeting which the various markets have sustained. A pros-

perous course seemed indubitably mapped out at one time for the different industries. Prices were high, for instance, copper was 27 and tin 47 cents, and so confident were the experts that the limit had not been reached, that an augmentation of these figures was expected. Supply had not overlapped the demand, and the markets were keyed up to full tension.

But prosperity, unfortunately, often over-laps itself. This fact was never better exemplified than in the case of copper—and the great crash of this metal struck the heaviest weakening blow to the markets generally. At the commencement of the year, with mills going at full pressure, copper was hard to obtain, and the demand apparently showed no signs of falling off, but the tension was too strong too last. The market for finished articles became glutted, the high prices ruling checked further stimulation, the demand began to break, and then came the beginning of the end.

Prosperity, unless steadied by checking influences must always in the long run be hoisted with its own petard. This has been repeated over and over again in the history of the various markets, not only in metals, but in the other products of the earth. It is the drastic cure that the law of average gives us. Every cycle of years sees such a rise and fall, and the commerce of the world is always better afterwards. Prosperity must be pruned of its inflation as the branches of an overgrown tree are struck off to give the root renewed energy.

Speculative agencies, apparently, played the greatest part in bringing the English markets to the perilous state it presented in the closing months of the year. Apart from iron there has been no steadiness in metals in the Old Country. The history of tin, for instance, closely approximates that of copper, excepting in the nature of the cause producing the crash, the one due to speculation, the other to over-production. But the toboggan-like character of the fall was the same. Situated as Canada was between the devil and the deep sea, between the Old Country markets on the one side, and those of the States on the other, there was no halfway course for the home markets. They had to slide with the rest, and the breakneck character of the slide can be seen from a comparison of the figures obtaining at the beginning of January and at the end of December.

Determining Amount of Radiating Surfaces

Simplified Methods of Estimating Hot Water Radiation—An Easily Understood Explanation Illustrated by Charts—Written for this paper by C. E. Oldacre, Toronto, and republished owing to a mix-up in the Illustrations in our Last Issue.

Many different rules and methods for determining the amount of radiating surface to accomplish the required results in heating have been evolved, several of them more or less accurate, and some of them more or less arbitrary. Some methods have been entirely "rules of thumb," aided by a factor of safety—wide experience.

Various formulae have been presented for calculating the required steam or hot water radiating surface that may be required to heat any given sized

sure is the British thermal unit, commonly abbreviated and designated B. T. U. The unit of heat is the inch or the pound of all heating calculations. It is the amount of heat that will raise one pound of water from 40 to 41 degrees Fahrenheit, or one degree.

With direct steam or hot water heating the source of heat is the radiator that is placed in the space that it is desired to have heated.

Radiators give off heat to the surrounding air in proportion to the dif-

ference in temperature between the surface and the air of the room. The same tests showed the amount as 1.712 B.T.U. for the rated square foot of surface. Also they showed that the total heat radiated by a standard 7-foot wall radiator was 2.325.

Heat Distributed by Radiators.

Numerous tests have been made of the quantity of heat given off by cast iron radiators, which affords a fairly accurate basis for determining the heating effect of any given amount of radiating surface.

Tests made some time since at Cornell University, under the direction of Prof. R. C. Carpenter give the amount of heat given off by a standard height, 3-column, cast iron radiator, as 1.732 B.T.U. per hour, per square foot of actual surface per degree difference in temperature between the heated surface and the air of the room. The same tests showed the amount as 1.712 B.T.U. for the rated square foot of surface. Also they showed that the total heat radiated by a standard 7-foot wall radiator was 2.325.

By several authorities the heat given off is taken as 1.6 B.T.U. per square foot of surface per degree of difference in temperature between the heated surface and the air of the room. In practice, it is a commonly accepted figure that allows for average conditions and has been used by the writer in preparing the accompanying charts.

Taking the total heat emitted by a radiator, as above at 1.6 B.T.U. per square foot of heating surface per hour for each degree of difference between the temperature of the heating surface and the air of the room, we will have with hot water heating when the temperature of the water is at 180 degrees Fahr., and the temperature of the air of the room is 70 degrees Fahr.,

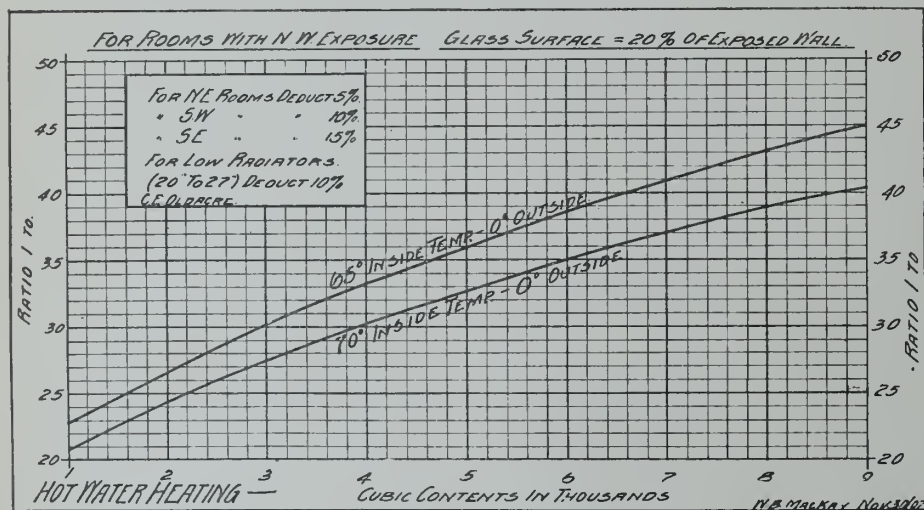


Chart I.—Showing amount of hot water radiation required for corner rooms. Inside temp. 70 degrees Fahr.; outside, zero; water, 180 degrees.

space under any given condition. To many they have been rather unintelligible as much of the data has been reduced to bewildering algebraic formulae.

Even for those perfectly familiar with these formulae, there is a great amount of time and labor spent in making the necessary calculations for determining the required surfaces, and much time and labor spent in checking up the figures in each case to see that no errors or omissions are made.

Time and Labor Saved.

It has been the writer's desire in preparing the following charts to afford a means of determining the required radiating surface in the quickest and easiest manner possible, thus saving much time and labor in the work of determining the surfaces required for the heating of any given space. In other words, these charts will be found short cuts, minus all mystifying formulae, and a quick method of arriving at results by a simple means that will give reasonably accurate results.

In all calculations the unit of mea-

ference in temperature between the surfaces and the air of the room. The higher the temperature of the surface, or the greater this difference, the greater the quantity of heat

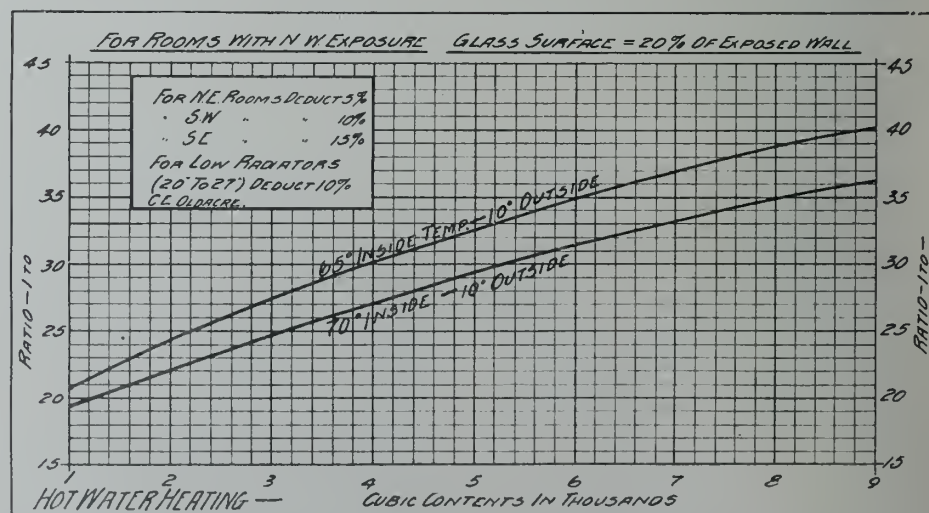


Chart II.—Showing amount of hot water radiation required for corner rooms. Inside temp., 70 degrees Fahr.; outside, 10 below zero; water, 180 degrees.

or a difference of 110 degrees, a total heat emission from the heating surface of $110 \times 1.6 \text{ B.T.U.} = 178 \text{ B.T.U.}$ per hour for each square foot. With steam heating, where the pressure was 5 pounds (temperature 228 degrees F.) and a room temperature of 70 degrees this would give as the total heat emission $(228-70) \times 1.6 = 253 \text{ B.T.U.}$ per square foot of surface per hour. With steam a greater transmitting effect can probably be had than that given, but it is safer to take the lower figure.

Any one wishing to inquire into and more fully study the subject will find much valuable information in "Principles of Heating," by William G. Snow, "Heating and Ventilating Buildings," by R. C. Carpenter; "Heating by Hot Water," by Walter Jones; in Mill's "Heating and Ventilation," and in "Formulas and Tables for Heating and Ventilating Work," by Prof. J. H. Kinealy.

Heat Losses.

The heat lost from a room is through three sources; 1st, through the glass; 2nd, through the walls; 3rd, through the change of air in the room. An increase of any one of these factors means a proportionately greater heat loss.

Accurate tests have been made of the heat lost through walls and glass so that the loss can be determined with fair accuracy under any given condition. But in calculating the radiation for a room, the loss due to the leakage of air around the windows and doors is an element which often does not receive ample consideration, and is the one indeterminate factor. In making these charts a change of air in the rooms of twice an hour has been used as a basis of the calculations. This allowance is ample for ordinary average conditions, but all building construction is more or less porous, and the amount of leakage will vary with different types and also as to whether the building is tightly constructed or not, so that no one set allowance can be made definitely to cover all cases.

In determining the total heat loss from any given room or building the

cooling effect due to one square foot of glass is taken as a standard or unit and the losses from the walls and from that due to changes of air in the room is reduced to the same standard or to equivalent glass surface. This is commonly designated in abbreviations by E. G. S.

In practice for house-heating the loss is taken at 1 B.T.U. for glass and .25 B.T.U. for ordinary walls per square foot per hour per degree of difference between the temperature of the air inside and that outside of the room.

One B.T.U. (British Thermal Unit) will raise the temperature of approximately 50 cubic feet of air one degree in one hour so that 50 cubic feet of air would carry off 70 heat units if the temperature were 70 degrees or twice this quantity if a change was made twice an hour. (One B.T.U. will raise the temperature of 48.7 cubic feet of air at zero one degree and 56.3 cubic feet at 70 degrees F.) The approxi-

So if we divide the cubic contents of the room by 25, where there is an allowance made for two changes per hour, we will have reduced the cubic contents to equivalent glass surface (E.G.S.) It is necessary that the loss of heat through the change of air in the room shall be taken into consideration in any calculations so as to arrive at the proper amount of radiation that will be required to heat the room to any determined temperature. If an allowance of one change per hour is to be made the divisor is 50, if a change of only one every two hours, then the divisor is 100. This loss will be the greatest, other things being equal, where the rooms are on the windward side and where they are the most exposed and is variable according to the wind velocity, and is the least on the more protected side of the house, so that in this latter case less radiation is required than in the first case.

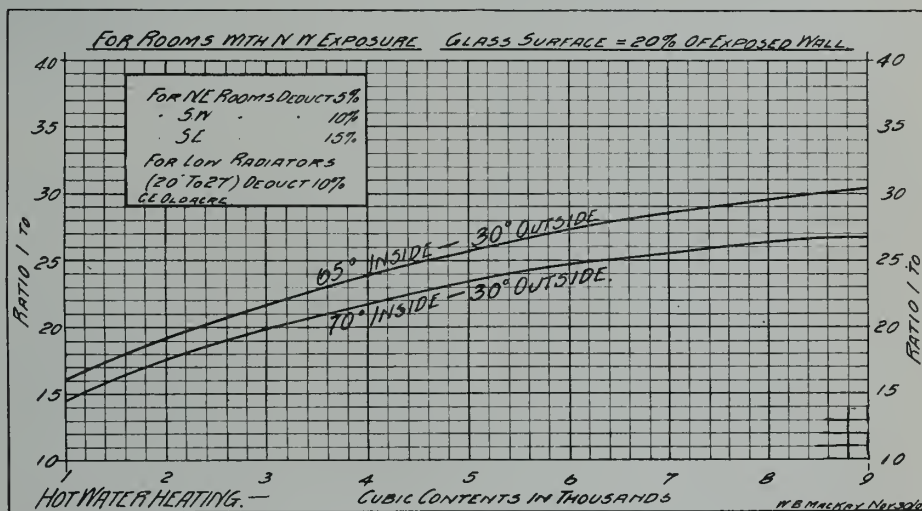


Chart IV.—Showing amount of hot water radiation required for corner rooms. Inside temp., 70 degrees Fahr.; outside, 30 below zero; water, 180 degrees.

mate figure of 50 cubic feet of air is here used as being more convenient for the purposes of easy calculation, and the little inaccuracy will make no practical difference in the net results.

A Practical Illustration.

As illustrating the method of determining the amount of radiation required and showing how inaccurate any set percentage or ratio without reference to the total cubic contents of the room, together with the glass and wall surfaces and the required changes of the air per hour, we will take a room of 4,000 cubic contents, which is to be heated to 70 degrees with zero outside. The room is a corner room, having two sides exposed to the north and to the west. It is to be heated by hot water, with the water at 180 degrees. Twenty per cent. or one-fifth of the total exposure is glass. The room is $20 \times 20 \times 10$ feet. This gives a total exposure of 400 square feet, of which one-fifth, or 80 square feet, is glass, leaving 320 square feet of wall surface. Dividing the wall surface by four gives us 80 square feet of equivalent glass surface. And dividing 4,000 by 25 gives us 160 square feet of equivalent glass surface. Dividing the difference between the inside and outside temperature $(70-0)$ by the difference between the temperature of the water

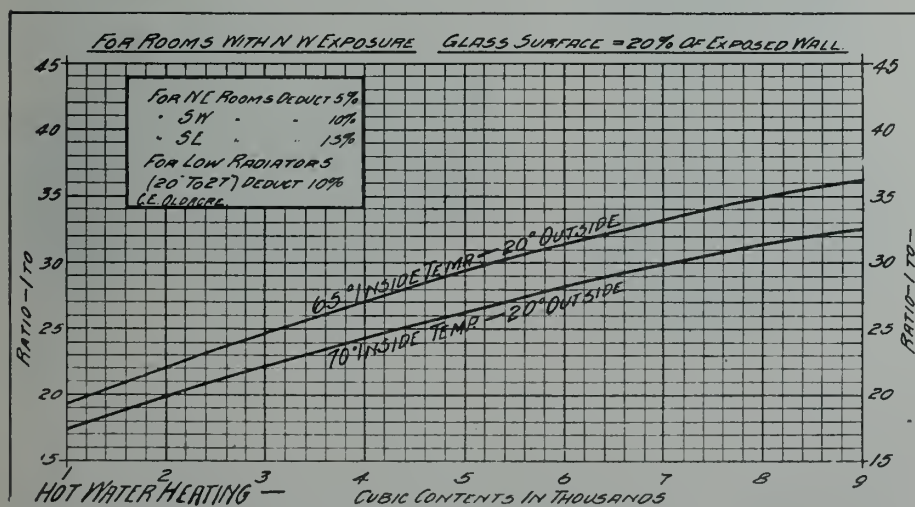


Chart III.—Showing amount of hot water radiation required for corner rooms. Inside temp., 70 degrees Fahr.; outside, 20 below zero; water, 180 degrees.

and air of the room (180—70 equals 110) multiplied by 1.6 (the heat radiated per square foot of heating surface per hour per degree of difference in temperature) gives us a factor of .4 for 70 degrees inside, and for 10 degrees below zero outside, a factor of .45 for 70 degrees inside and 20 degrees below zero outside, a factor of .51, and for 70 degrees inside and 30 degrees below zero outside a factor of .57. These number .4, .45, .51 and .57, here spoken of as factors, represent the amount of heating surface in decimal parts of a square foot that will be required at the various outside temperatures stated, for each square foot of glass, or equivalent of glass surface, to maintain 70 degrees inside the room.

Adding together 80 and 80 and 160 gives us 320, and multiplying this by .4 gives us 128, or 128 square feet of radiation required to maintain seventy degrees Fahrenheit in the room of 4,000 cubic feet at zero outside. This corresponds to practically a ratio of 1 square foot of heating surface for each 31 cubic feet of contents.

How to Use the Charts.

In using the charts the perpendicular lines indicate the cubic contents of various sized rooms from one thousand cubic feet up to nine thousand cubic feet. Each of the smaller divisions represent 200 cubic feet, so that the first line after the figure one at the bottom of the chart indicates 1,200 cubic feet, and so on. The horizontal lines indicate the ratio or divisors, and the diagonal curves represent the temperature. Taking the chart for zero outside, we will, for example, see the line representing 6,000 cubic feet intersects the curve 70 on the horizontal line 35, so, dividing 6,000 by 35 gives us the required radiation, or 171 square feet, for a room exposed to the north and west and having two sides exposed, and 20 per cent. of the surface is glass surface. If 65 degrees is desired, then $38\frac{1}{2}$ would be the divisor. It will be found that in average rooms that 20 per cent., or one-fifth of the exposed surface, is glass surface. When the amount is greater, the experienced eye will at once detect it, and the proper additional amount of surface will be added.

The same method is to be pursued whether the temperature is 10, 20 or 30 below zero outside, using the proper chart. A few minutes' practice will permit of them being handled quickly and will save a great deal of labor in figuring and may be used to check extended calculations where they may be necessary.

Additional charts covering different conditions of construction and exposure will be given in our next issue, for hot water heating, as also charts for steam heating under all the usual conditions to be met with in average house heating work.

No woman sees a modern fitted bathroom without wanting one for her own home. How many women in your city know what beautiful bathrooms you can fit up?

Importance of Perfect Ventilation

An Article by R. C. Fay Treating of the Relationship Between Pure Air and Proper Heating—How the One May be a Detriment to the Other.

The writer recently took occasion to show, if possible, the great responsibility which is assumed by the builders of to-day, when erecting modern buildings for either domestic or commercial purposes. During the course of an article, the question of ventilation was given more or less attention, bringing to the reader's notice sentences where the health, and often the life of ten-

bodied in the direct-indirect radiator.

This indirect radiator is one of the greatest inventions of the age; the cold fresh air from the outside being brought into the radiator case, where it is thoroughly warmed, and emitted from the fresh air register, supplying a constant stream of warm, fresh air, and at the same time promoting perfect health among the occupants of the building.

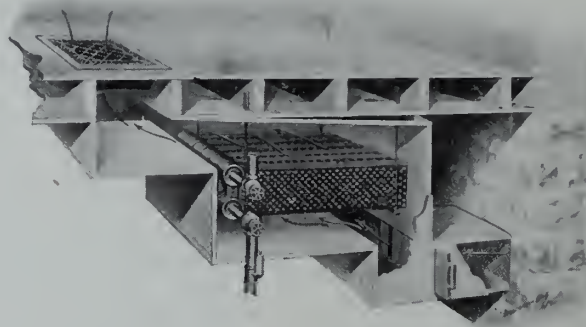


Fig. 1—Showing Installation of Direct-Indirect Radiator.

ants, hinged on the ventilating methods employed.

If a person were compelled to breathe the same air over and over again, it would rapidly become unfit for use and dangerous to life. There are organic substances given off in respiration which are poisonous when breathed again, consequently proper precautions must be taken to provide constant change of air. It is easier to ventilate ordinary dwellings, as the fresh air finds its way in through walls, joints, around windows, doors, etc., but in large buildings, schools, churches, theatres, etc., a constant supply of fresh air must be pro-

The box or case enclosing the radiator is made of seasoned wood, lined with asbestos and bright tin. The sides of the box almost touch the ends and sides of the radiator, so that the cold air getting in through the duct is compelled to pass up through the sections of the radiator on its way to the rooms above. In the construction of the air duct, care should be taken to provide a slide as shown in the accompanying illustration, so that the air may be cut off, when the radiator is not in use.

Another efficient form of ventilation is made possible by converting any radiator into a direct-indirect radiator by means of a cast iron box base shown in the above illustration.

The mission of the direct-indirect or ventilating radiator is the same as the



Fig. 2—Illustrating Conversion of any Radiator to Direct-Indirect Type.

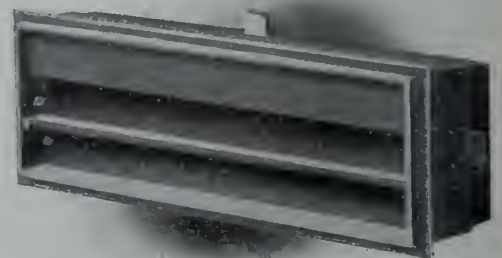


Fig. 3—Wall Box or Fresh Air Inlet.

vided, thoroughly warmed, by the heating apparatus, to the proper temperature.

One of the best and most widely known methods of ventilation is em-

indirect radiator, namely, to permit the operator to supply plenty of warm, fresh air, forcing out the impurities which are naturally present in the rooms above. The box base to be efficient should be equipped with a device

so that either the bottom or back inlet can be used.

The wall box, or fresh air inlet, as illustrated above, is placed on the outside of the wall, and is equipped with a close meshed brass cloth which prevents leaves and other foreign matter from interfering with the passage of fresh air through the air duct into the box base.

There are two ways of moving air for ventilating purposes; first, by expansion due to heating, second, by mechanical means.

We have considered the former method (by heating) in the preceding paragraphs, but ventilation by mechanical means is of equal, if not greater importance, as the erection and construction of buildings often interfere with these methods.

Ventilation by mechanical means is accomplished either by pressure or by suction. The object in either case is the same, namely, to supply fresh air of the proper temperature to the occupants of the building.

The air inlet, wherever possible, should be located in or near the ceiling of a room; the advantages to be gained by such construction are many, but space only permits mentioning the most important. The warm air displaces the impure air, and gradually the room becomes filled with pure fresh air, the cooler air sinking to the bottom, where it is taken off by the ventilating shaft.

When the air inlet is placed in or near the floor it acts as a receptacle for dust from the room, and a capital place for the breeding of microbes.

The outlet for air in the above construction should be placed as near the bottom of the room as possible, connected with a flue of ample size and kept at a temperature higher than that of the surrounding air, unless mechanical circulation is used, when the natural pressure will keep up the necessary circulation.

The extraction of impure air by fans has many advantages, as, when they are used as the extracting forces, the draft is very easily regulated simply by altering the speed at which the fan is driven.

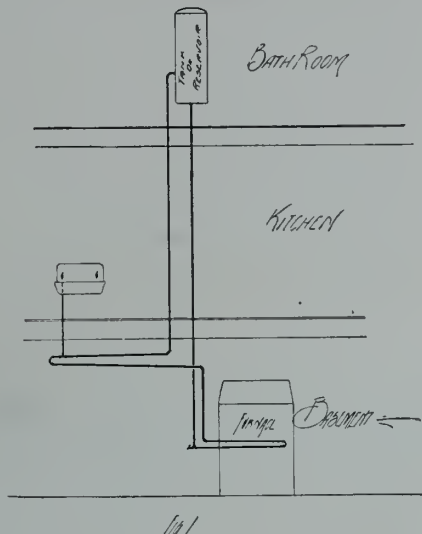
In passing through the aisles of a large manufacturing plant one does not have to be a student of humanity to observe the drawn, peaked faces of boys and girls who are operating the machinery, or doing "piece work." Possibly a casual observer will attribute this condition to long hours, another to their work, and still another to diseases firmly implanted in the bodies of these workers. It may be one cause, or it may be another, but if the true facts were known, the secret of the suffering of these workers lies, many times, in the poor ventilation and the lack of sunlight in the factory room where perhaps hundreds of girls and boys and men and women are breathing the same air over and over, the only relief being from an open window, the draft from which causes disease and is eating the life out of the misguided individuals who remain in its path because of the fresh air thus obtained.

It would be hard to reckon how many deaths annually can be laid at the door of commercial enterprises where little or no thought is given to the "importance of ventilation."

HOT WATER FROM FURNACE.

A subscriber in Oshawa writes us inquiring about the advisability of a circulating connection for the domestic hot water supply from an auxiliary water heater in a furnace.

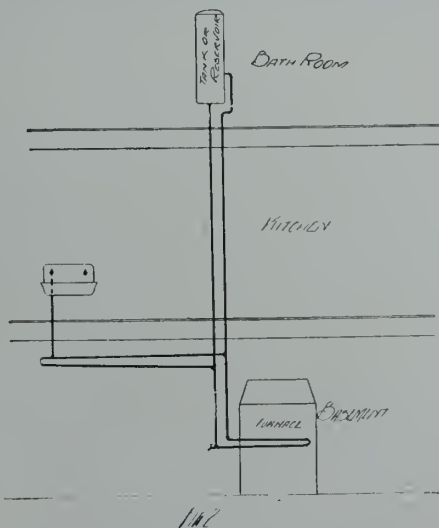
The connection our correspondent has in view is shown in Fig. 1. This would undoubtedly work well under ordinary



conditions, if there was a continuous rise in the flow pipe leading from the furnace to the sink and thence back to where it led up to the tank. But it makes a considerable extra amount of friction in the flow pipe and would not work as well as the connection shown in Fig. 2.

The manner of fixing the pipes is practically the same as that used in connection with the tank system in England, in which a separate cold water cistern is used to feed the hot water tank. In the sketch sent us the source of the cold water supply is not shown, but it is assumed that the same is from the corporation water service or from a reservoir tank and that a proper connection is made to the tank.

If the sink is not a considerable distance away from the tank and the furn-



ace, very little, however, would be gained by any method of circulation to the sink, as more heat would be lost in the circulation pipes than would offset the disadvantage of the amount of cold water that would need to be drawn if the

connection were made direct to the top of the tank or reservoir.

But the latter would have the advantage that there would be no likelihood of the cold and warm water mixing, as there might be with the circulation systems shown. This, of course, applies only if the tank has a connection to water service pipes from the street or a higher tank, and is not hand-fed.

THE FREEZING OF WELLS.

Throughout many of the Northern States and Canada the freezing of wells and pumps causes much trouble and the greatest difficulty is experienced in keeping some wells open for use during the winter. Strangely enough, the shallow open wells give less trouble than the deeper, drilled or double-tubed driven wells, in which the inner or pump tube is carried below the outer casings. The determination of the cause of the freezing and of means for its prevention is of so great practical importance that a study of the subject has been made by one of the geologists of the United States Geological Survey. The freezing of wells is practically confined to districts where the air temperatures frequently go considerably below zero and where the materials penetrated are either porous or contain actual openings and passages through which the air can circulate. Deep wells that freeze may also exhibit other peculiar phenomena, such as indraft and outdraft of air, producing sucking and blowing, changes in character of water, fluctuations of water level and in flowing wells changes in discharge.

A study of the phenomena, as a whole, shows that they are connected closely with barometric changes. Freezing, indraft, low-water level, small discharge and clear water are all characteristic of clear weather and high barometer; thawing of the well and melting of the snow about the mouth, strong discharge and discolored waters always accompany low barometer. The direct cause of the freezing seems to be an indraft of cold air at periods of high barometer. Change of weather, reversing the direction of the air current, produces the thaw.

Many of the simpler devices adopted to prevent freezing are complete failures, while others are partly successful. The inherent difficulty lies in the construction of the well. The following suggestions are made by the geologist:

In open wells, where air obtains access through the soil and at the junction of the curb and cover, a cement cover should be tightly fitted to the curb, and the curb itself should be coated with cement for some distance below the surface.

In drilled or double-tubed driven wells the current of cold air drawn in at periods of high barometer between the outer and inner casing near the surface and passing out in a porous bed at the bottom above the water level will cause freezing if the water is pumped so that it stands in the inner tube above the lower end of the outer casing,

and a long continued current of such cold air may cause freezing of the ground water about and in the well tube. For this condition it is suggested that the space between the outer and inner tube near the surface be packed with some impervious material. A filling of cement resting on an improvised plug is probably the most effective. The home-made rag packing sometimes used is too porous to serve the purpose.

The same treatment is suggested for wells with leaky castings, for driven wells passing through rocks porous enough to permit the passage of large currents of chilled air during periods of high barometer and for wells in which the outer casing ends in some cavern or open passage—that is, the space between the well tube and the pump tube near the surface should be plugged tightly with impervious material. About some wells the ground crevices through which the air circulates are so numerous that immunity from freezing can be obtained only by plugging the space about the pump tube from top to bottom with cement.

WATER FILTER AND COOLER.

Dr. A. P. Aurness, Minneapolis, has patented a contrivance for sterilizing, filtering and cooling water.

In appearance the vessel resembles an ordinary water cooler, but in its make-up it is vastly different. The upper half of the can is the heater and is fitted with a perforated shell through which the boiled water is filtered and cooled in a compartment packed with ice, which cools and aerates the water without any contact with the ice, thus the water remains free from any form of bacteria. The bottom half of the new invention is made for the storage of the sterilized water, which is fitted with a stop-cock to enable the water to be drawn off.

WATER SUPPLY OF A COTTAGE.

J. A. F. Cardiff, in the National Builder.

The accompanying illustration represents a section of a cottage and shows a system of piping for the supply and distribution of cold water, the supply being taken from the city water main and the water pressure being inadequate to reach the fixtures above the basement.

The low pressure is overcome by placing in the attic, well above the highest fixture, a house tank of sufficient capacity to provide an ample supply of water to all of the fixtures for twenty-four hours. This tank is supplied from the suction tank located in the cellar, by means of an automatic electric pump.

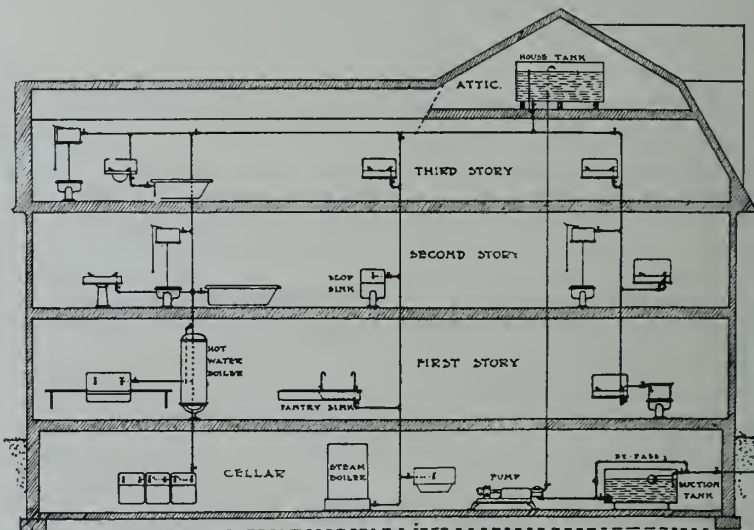
The principal thing to be considered in this particular kind of an installation is the suction tank, as the pump, house tank and piping arrangement beyond this point is little different from the examples given in previous numbers.

The suction tank is required so that the house pump when operating will not suck directly from the water main and thereby reduce the pressure and the flow of the water to other buildings

in the neighborhood. The tank should be large enough to hold a day's supply of water, and it will then afford another advantage in that it will provide a supply of water during such periods as the main supply may be shut off owing to the necessity of repairs to the street main.

The main supply pipe is carried in through the foundation wall and there controlled by a globe valve. It is then extended to the suction tank and the supply controlled by a ball cock. From the bottom of the suction tank a valved suction pipe is run to the pump and from the pump discharge a valved riser is run to the house tank in the attic. The inlet end of the suction pipe is protected with a globe-shaped wire strainer. A valved by-pass connects the pump suction to the main supply pipe so that, if it is necessary to cut out the suction tank for repairs, the pump can suck directly from the main.

The down supply pipe from the tank feeds a main header run across the ceiling of the third story and from this header valved risers are dropped to supply the various stacks of fixtures. These risers are provided with waste valves at their lower ends so that the entire system of piping may be emptied.



Water Supply of a Cottage.

A NEW CLOSET LID.

J. E. Albright, Greensboro, N.C., has invented a closet lid which prevents seats from warping or splitting. The seat has a groove around its inner side in which is placed a metal band, expanded by heat, when cooled the band contracts and grips the groove, which materially adds to its strength.

MOTOR CAR HEATER.

A new motor car heater, which is claimed, will change the temperature of a closed car from zero to 60 degrees Fahr. in a few moments, has recently appeared, the hot gases of the exhaust being used to supply the heat.

A jacket is fitted around the muffler, forming a hot air chamber; cold air is admitted through a port in the forward end of the jacket, while at the opposite end, the chamber communicates with a pipe that leads to a register in the floor of the car. The motion of the automobile provides the draft, and the

cold air in the chamber is heated by the muffler and passes through a register into the car.

This heater may also be used to good effect in an open car.

HOW TO BEND LEAD PIPE.

In bending lead pipes great care is required that the bend shall be of an even thickness after the bend is made. In lead pipes from 1½ to 2½ inches in diameter it is a great help to dress the pipe at the point where the bend is to be made on each side in order to partly flatten same, and with practice you will be able to make bends without having to depend upon the bobbin or drift for small-sized pipes; of course, the pipe should be heated where it has to be bent, I prefer to use the molten lead or solder to make same hot, as by the use of lead or solder you are able to make the pipe the required uniform heat for bending, says Frederick Knight, a British lecturer on plumbing.

In lead pipes from 2½ inches in diameter upwards it is a great mistake when bending to have too great a pull-up, as it is termed, as it makes it very difficult to use the dummy, and does not

give you the opportunity of working the lead from the throat to the heel.

Sharp bends should not be made wherever it is possible to make easy bends, as they only check the flow of whatever the pipes are used for, and all bends should be constructed by the plumber so that they can be easily cleansed if required by drain-rods or brush.

It has become a common practice to make bends sharp, owing, no doubt, to the free use of the bobbin. Bends should not be made entirely with the bobbin, but should be made with the dummy, as it enables you to work the metal where required. As with bobbins, they only distress the heel of the bend, but they can be used with advantage as a saving of time and labor to dress bends upon.

An explosion took place at the Queen's Hotel, Prince Albert, a few days ago. The kitchen range blew up, it being supposed that the pipes were frozen.

Robertson's New Montreal Showrooms

Artistically fitted up, with a subdued decoration scheme designed to blend with and set off the character of the exhibits, the new sanitary exhibition rooms of the James Robertson Company, Limited, at 66 Beaver Hall Hill, Montreal, are commanding general attention and appreciation. The advantage of display to buyer and seller alike, no matter what the line of trading may be, is obvious. A catalogue, even if profusely illustrated, cannot give to the intending purchaser the complete idea of a fitted-up utensil that can be obtained from actual observation of the article as it would appear in use. The object of James Robertson Company has been to afford architects, plumbers, and their clients, the opportunity of complete inspection—an advantage which will be beneficial, both to the customer and the firm.

The front of the building and the en-

cleanliness, as well as of attractiveness to the observer.

A special feature of the exhibition is the four completely fitted-up bathrooms, in compartments of their own, thus giving a perfect idea of the whole effect. How pleasing, as well as serviceable, a bathroom can be made, is now apparent. One tiled room—which will be especially admired by the lady visitors—is finished entirely in white from ceiling to floor. Barring the taps, which are of nickel ware, all the accessories are of china, and the whole effect is most harmonious. By this idea, the amount of nickel ware is cut down to a minimum. The advantage, if only in so far as the saving in labor of cleaning be concerned, is obvious. Another bathroom, less elaborate in treatment, is finished in burlap, giving an idea of how artistically the walls could be treated in colors if desired. A neat bachelor

faulty connections. Porcelain and porcelain-enamelled iron kitchen sinks and laundry outfits are also shown, as well as special lavatories and water closets for hospitals.

Altogether, the exhibition is splendidly conceived, and well worth a visit. A woman attendant has been engaged to assist lady visitors. Under the conductorship of the manager, W. P. Baxter, no one will regret an inspection of the bright and commodious show-rooms.

SANITATION IN NEW YORK.

In a report which was recently sent to the governor by the Merchants' Association of this city Dr. Daniel D. Jackson calls attention to the city's need of better sanitation in our own city. Our entire water front is without decent sanitary toilets and most of the wharves are without any at all. The sewer conditions are intolerable. It is to be hoped that the gross de-



The James Robertson Company's Elaborate New Showrooms in Montreal.

trance is purely colonial in style. A large window, fitted in white Italian marble, gives opportunity for ample display. The interior, extending to considerable depth, and lighted at the back with stained glass windows, lends itself admirably to the display of baths, closets urinals, and various bathroom accessories. Decorated in weathered oak and burlap, with artistic electric lights to match, the walls relieved with bathroom mirrors and fittings, and palms placed in odd corners, the interior presents a pleasing, and at the same time businesslike appearance. The firm are making a comprehensive display of their specialty, the Kingdon china. This material is particularly adapted for sanitary commodities. It is impervious to stain from ordinary usage, it is exceedingly durable, and in addition, is pleasing to the eye. Here are lavatories, slop sinks, closets, and urinals of the latest design, all made of this serviceable china, and conveying a sense of

bathroom, with its needle-bath, foot-bath, basin and water closet, and fitted in white as far as possible, will please the eyes of all men visitors. A special study of shower baths has been made by the firm. One ingenious arrangement does away with the old-time trouble of having to turn on the shower before the temperature of the water can be ascertained. By a simple contrivance the degree of heat can be regulated before starting the shower.

A comprehensive display is also made of the "Naturio" water closets, which the firm consider to be the most perfect closet on the market. A great advantage of this closet is that the flow of water is practically as noiseless as running water can be made to be, which is a great convenience in flats and apartments. A great specialty is the Kingdon siphon jet urinal, with water-sealed outlet connection to the soil pipe, which does away with any danger of sewer gas getting into the building through

fects in general sanitation as well as in sewage disposal will be remedied before the summer of 1908. We have estimated that proper sanitation will reduce the typhoid deaths in New York City from 650 to 360 a year and the diarrhoeal deaths from 7,000 to 2,000 a year. This latter figure provides that germ-infected flies are not permitted to contaminate the milk supply either before it reaches the city or after. The saving of more than 5,000 lives a year will also be accompanied by the additional saving of some 50,000 cases of sickness."

HEATING ENGINEERS TO MEET.

The fourteenth annual meeting of the Heating and Ventilating engineers will be held in the Engineering Societies' Building, 29 West 39th St., New York, on January 21, 22 and 23.

NEWS OF THE TRADE IN CANADA

Thomas Forest, Montreal, has been registered as a plumber.

L. J. O'Dell, plumber, London, spent the New Year's holidays in Toronto.

R. J. Lockhart, of the Gurney, Massey Co., Montreal, is spending a few days in Toronto.

Paul Smith, recently with Cluff Bros., Toronto, has been spending a fortnight's holidays at Detroit.

Norman Clark, of Adam Clark & Co., Hamilton, plumbers, was re-elected an alderman of that city on Monday.

H. Mahoney, of Mahoney Bros., plumbers, Guelph, was elected an alderman at the elections in that city on January 6.

Miller & Burroughes, plumbers and steam fitters, Toronto, have dissolved partnership. The business will be continued by B. J. Miller.

Russell & Barrett, who have carried on a plumbing and steam fitting business at Saskatoon for some time, have moved to Prince Albert.

The Western Plumbing & Heating Co., Saskatoon, have had a busy season and several important contracts in that district have been filled by them.

The Standard Valve and Fitting Co., Guelph, has reopened its plant, after two weeks' shut-down, owing to more modern machinery being installed.

The work of laying water mains is being pushed in Toronto by the engineering department. This will mean much work for the trade during the coming year.

A Montreal despatch says that the city of Montreal has expended over eight million dollars for new buildings during 1907. The record was considerably below that of 1906.

The Property Committee of the Murray Street Baptist Church, Peterboro, Ont., has awarded the contract for the installation of the new heating system at the church.

Gordon Little, bookkeeper for G. Larter, plumber, Toronto, was arrested this week at the instance of his employer. Little is charged with theft, having appropriated about \$57 of the firm's money.

The Sarnia Brass Works, Sarnia, Ontario, Canada, manufacturers of plumbers' brass goods, have commenced to install their machinery and will shortly be in operation.

Toronto's city engineer reports the need of an overflow sewer and of extending the Rosedale creek sewer south. The cost of the work would be in the neighborhood of \$200,000.

Wm. Linton, of the Standard Ideal Mfg. Co., Port Hope, and O. M. Hodson, of the H. R. Ives Co., Montreal, were elected aldermen of the town of East Toronto on Monday.

Mr. Nichol, an employe of the Dominion Heating and Ventilating Co., Hespeler, left this week for Washington State, to join his brother there, where they both have important real estate interests.

Markdale, Ont., has secured plans for a waterworks system, the cost of installing to be about \$20,000. The pump

recommended by the engineer is a steam one with a maximum capacity of 400 gallons a minute.

Piles of radiators which have lain on the Saskatoon streets during the summer months have now all been placed in the buildings for which they were intended.

G. I. Taylor, plumber, who opened a business at Saskatoon during the spring of 1907, has worked up a large business. He had the contract for plumbing and sanitation at the city hall, which proved the heaviest of the season.

Despite the falling off in building operations in Toronto during the past three months the annual returns show an increase over 1906 for the year of about \$1,000,000. There were 130 more permits issued in 1907 than in 1906.

G. F. McKnight, of McKnight & Frost, steamfitters, Edmonton, is on a honeymoon trip to the east with his bride. The couple were in Toronto during the week and will spend a fortnight at Owen Sound, their former home.

Ben Noble, master plumber, London, was an unsuccessful candidate for alderman in the elections in that city this year. George W. Armstrong, brass manufacturer, was one of the successful candidates.

Oakville, Ont., is asked to guarantee 5 per cent. on a 30,000 first mortgage to help establish a tile works to make sewer pipe and electric conduits, which will employ 50 hands and pay out \$123 in wages per day.

The largest steam heating job of the year at Saskatoon was that of the City Hotel, and this was installed by the Splayford Iron Works Co. A 55 h.p. boiler of the Frost Manufacturing Co. was used with one hundred and thirty-three radiators.

The fifth of Winnipeg's water supply wells was opened up last week, and will be connected with an eighteen-inch main. The day the well was opened about two million gallons of water was added to the supply. The city contemplate the construction of two more wells.

Elford & Cornish, plumbers and steam fitters, Saskatoon, have completed the following contracts during the season: Iroquois Hotel, Saskatoon Bottling Works, Lunn's hotel at Asquith was also improved by the installation of a system of hot water heating.

A narrow escape from serious injury occurred at the Page-Hersey Iron and Tube Co., Guelph, recently. A young Scotchman named McDonald was unloading a hoist, when the chain broke, releasing a beam, which struck McDonald in the face, breaking his nose and gashing his forehead.

The annual meeting of the Chatham Steam Heating Co. was held last week at the same time as the electric railway meeting, the same officers being elected, save that N. H. Stevens was chosen vice-president, instead of Mr. Gordon. A dividend of 2½ per cent. was declared on the capital stock.

R. J. Elliott, master plumber, Kingston, has his plumbing contract on the Toronto armories about finished. The men expect to return to their homes in a week's time. This firm has the con-

tract for plumbing and steam fitting at the new Government armories at Belleville, which will be erected in the spring.

A pretty ceremony took place on New Year's day, when W. H. Cunningham, a traveler in the employ of the James Robertson Co., Toronto, was married to Miss Ethel Kate Nixon, who was also an employe of the same company. Mr. and Mrs. Cunningham were presented with a beautiful cabinet of silver by their friends of the James Robertson Company.

E. Laidlaw, who has been employed as a clerk by Cluff Bros., Toronto, for some years, has left their employ to go on the road in the interests of the General Brass Co., Sterling road, Toronto. Mr. Laidlaw was presented with a handsome traveling bag by his fellow employes on severing his connection with Cluff Bros.

In reporting on the most modern methods of sewer ventilation, Toronto's city engineer is of the opinion that the open system of manholes as adopted in Toronto has proved more satisfactory than other plans in operation at the present time. In some cities tall shafts connected with chimneys have been erected, but this method of ventilation has been practically abandoned during recent years.

The long standing claim of Hyde & Webster, of Montreal, against Fredericton, on account of pipe delivered under contract for the sewerage system, has been settled at last. The firm consented to accept \$3,088 in settlement and their local solicitors, Slipp & Hanson, were handed a check for this amount. The city will retain possession of a quantity of the pipe which Engineer Barbour condemned while the work was going on.

The Nash Thermostats, Limited have opened a branch factory on Richmond street, Toronto, to manufacture heat, moisture and pressure regulators, boiler feeds and air filters. The company have secured the manufacturing and selling rights for Canada from the parent company of the same name in the United States. The Dewson street school, Toronto, has been fitted with their heat regulation system and since installation has proved satisfactory.

An echo of the old plumbers' combine was heard in the Toronto County Court room on December 16, for the payment of two promissory notes for \$250 each. The case is of three years' standing. The defendants of the case claimed that when the combine was exposed the plaintiff company were found members and so the \$500 had not been paid. The case will be concluded at the next sitting of the Division Court, and its result is awaited with interest by the local plumbers.

SANITARY INSPECTORS TO MEET.

The annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers will be held in Chicago on February 10, 11 and 12, 1908. President Davis has appointed John K. Allen, Chicago; C. B. Ball, Chicago, and E. H. Donahue, Peoria, as committee on arrangements. H. J. Luft, of Cleveland, O., is chairman of the publicity committee, and desires all members who have papers to be read to communicate with him at 2062 E. 102nd St., Cleveland, Ohio.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Jan. 7.—Great activity has characterized the plumbing industry throughout the year. The extensive fall construction work of 1906 carried the trade well forward into 1907, so that there was no break in the continuity of the call. Building operations in the year just closed, if not up to the high total of 1906—there being a difference of \$236,000 in the comparative values of the building permits—were extensive in character, and created plenty of work for the plumber, and a satisfactory demand for all lines of supply. The only unsatisfactory note struck was the rather heavy list of plumbing failures. This was, however, in the majority of cases due to the failure of the contractor, involving the firm undertaking the sub-contracts, rather than to any trade depression, or to bad business methods. There seems to be an idea in some quarters that trade will not be so brisk in the current year, owing to the shelving of building operations due to the money stringency. This, however, is another case of being unduly frightened at a shadow. There is little doubt that in a short time confidence as to the future will have generally returned, and ideas entertained as to the holding of building propositions will be speedily cast aside. Cities, towns, villages, will grow apace, and the plumbing demand must develop at the same time.

During the summer the trade suffered great inconvenience through congestion at the freight sheds, goods lying undelivered three weeks and more at a stretch. Transportation has been ineffective all the way through, and it is high time that an effort should be made to mend this state of things. When it is considered that 10 to 15 days used to be the longest delay, the seriousness of such a situation can be understood. In June during the height of the building operations, the demand on all lines was so great that manufacturers could not meet it, and some time elapsed before stocks were filled again. In July trade conditions were characterized by some price-cutting among the jobbers, and prices were slashed, especially in enamelware, soil pipe and fittings. The remainder of the year was without any great feature, except the satisfactory one of a continuance of the heavy business. Factories have been uniformly busy, and orders piled up until the close of the year. Taking everything into consideration the plumbing industry had a most satisfactory twelvemonth.

Iron Pipe—Iron pipe, owing to the difficulty of the mills in procuring raw materials, and the heavy demand, has been most scarce, especially in some sizes. Owing to this, prices steadily but slowly advanced from the first, as can be seen from the fact that 1-inch black was quoted at \$5.12 and galvanized at \$6.77 early in the year, while at the end quotations were, black \$6 and galvanized \$7.91. Supplies improving somewhat in the last few weeks give hopes that by the time the full demand approaches the mills will be in better shape to meet the rush.

Enamelware—With the other allied plumbing lines, enamelware has been in great demand, and so heavy was the call in June that the supply houses found it necessary to make provisions at least two months ahead. Factories have been running day and night, and

the only unsatisfactory feature was the price-cutting competition, which marked the trade during the summer.

Brass—Last year would have been a bumper one all the way round for brass goods had not the great cataclysm in copper brought down prices, though not to any slumping extent in the closing months. So strong was the demand for various lines that manufacturers could not cope with it, and there was considerable delay in delivering supplies. Although in July it was anticipated that prices would be affected by the copper situation, it was not until October that there was a reduction of 10 per cent. in brass values. Manufacturers were so well stocked that prices were kept up to a higher level than would otherwise have been the case.

Soil Pipe—Supplies have been well able to cope with the strong demand, owing to the fact that manufacturers worked steadily the previous winter, and accumulated adequate stock. To conform with the revised prices issued by the American manufacturers early in the year, discounts were altered on this side.

Radiators and Boilers—The demand in these lines has been exceedingly heavy, and until December, manufacturers had great difficulty in coping with the orders. In fact for some time it was impossible to guarantee prompt shipment. Prices have been firm.

Lead Pipe—Up to late in the year, lead pipe held firm in price, but the fall in the British pig lead market caused a sagging of prices here. Business in the earlier months of the year was very good, but there was a falling off in the autumn. The demand increased a little around December.

TORONTO.

Toronto, January 7.—The plumbers and steamfitters in this locality have about finished taking stock, in most cases the business of the year just ended proving very satisfactory. The New Year was ushered in with fine, cold weather, and though not severe enough to burst water pipes, the plumbers have had all the work they could do for some months. All concerns dealing in steamfitters' supplies in this locality are thoroughly satisfied with the results of the fall business. Building permits are more than a million dollars in advance of 1907, hence the trade has thus received a boost.

The travelers representing the different Toronto offices have in the majority of cases returned to their districts for the first time in 1908, and the reports coming in, though not up to the average of this time last year, are quite satisfactory to the jobbers.

During the month the jobbers will in most cases present new price lists to customers, the indication being for a drop in some lines, such as iron and products. There is but little change in the situation of the market, and until after the new discount sheets have been published business is bound to be more or less dull. There is little doubt that confidence in the future is gradually returning.

Iron Pipe—The demand for iron pipe

is not so acute at present, owing to the cessation of building operations, and in nearly every case contract work on buildings was completed before the new year. American mills are having difficulty in getting supplies of raw materials and, in consequence, shipments have been delayed for some time. The common plumbing sizes continue to be scarce, but the manufacturers should not have much difficulty in catching up with the demand, before the coming of spring. Prices remain unchanged, though a raise is predicted. We still quote 1-inch black at \$5.61 and galvanized at \$7.26.

Soil Pipe—The market situation of this commodity remains unchanged, with little or no demand existing, as most retailers put in large stocks before the raise. Prices are as follows: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent., and fittings, 60 per cent.

Lead Pipe—The situation on the British market has had no further effect on the local market since last writing. Lead pipe and waste remain at 10 per cent., and caulking lead 5½ cents per pound. Traps and bends remain at from 50 to 60 per cent.

Solder—The cessation of building has affected the sale of solder to a great extent, and at present little demand exists. Prices remain unchanged at 18c, with half and half quoted at 20c.

Cast Iron Fittings—The New Year's business in fittings has so far been fair, and at present are holding their own on the market. Supplies at present are plentiful, and are still quoted at from 50 to 50 and 10 per cent. off list price.

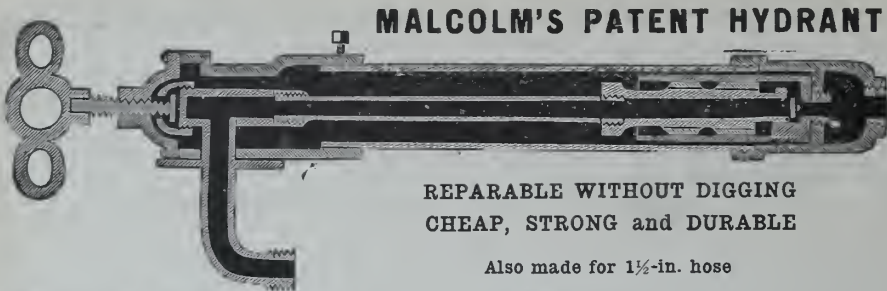
Radiators and Boilers—In this market a fair demand exists, the demand for kitchen boilers being good all fall. Quotations remain at 50 and 50 and 10 off list.

Brass Goods—The demand for brass goods is not extensive at present, and the jobbers are looking for a drop in prices. Compression work is still quoted at 60 per cent., and basin cocks at 55. Fuller work is held at 65 per cent. off list. Ground work quotations remain as follows: Bibbs, 45; roundway, 50, and flatway work, 50 and 10 per cent.

Enamelware—The September prices are still in force and fair demand for small orders exists at present.

PHILADELPHIA'S REGULATIONS.

The Board of Health of Philadelphia, in connection with its rules and regulations governing house drainage, amended Rule 121, as follows: The term "Master Plumber," as used in these rules, shall be taken to mean a person who has an established place of business, and who, either as principal or as the representative of any person, firm or corporation represents himself as competent and qualified, and undertakes to construct, alter or make any additions, or who for himself or for any person, firm or corporation undertakes to, and does construct, alter or make any addition to a system of house drainage.



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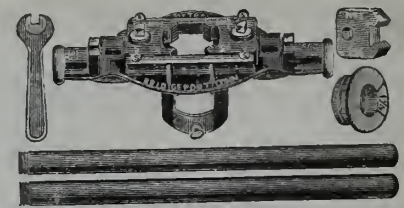
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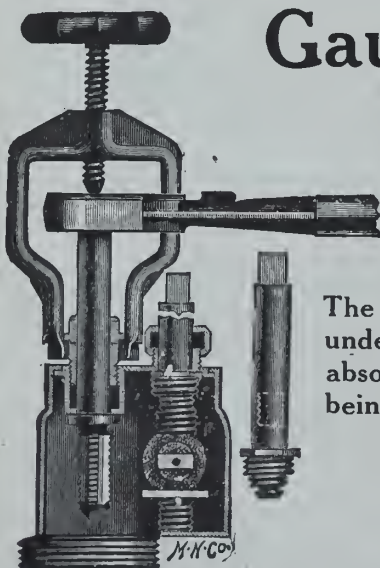
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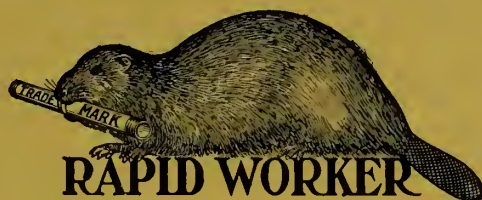
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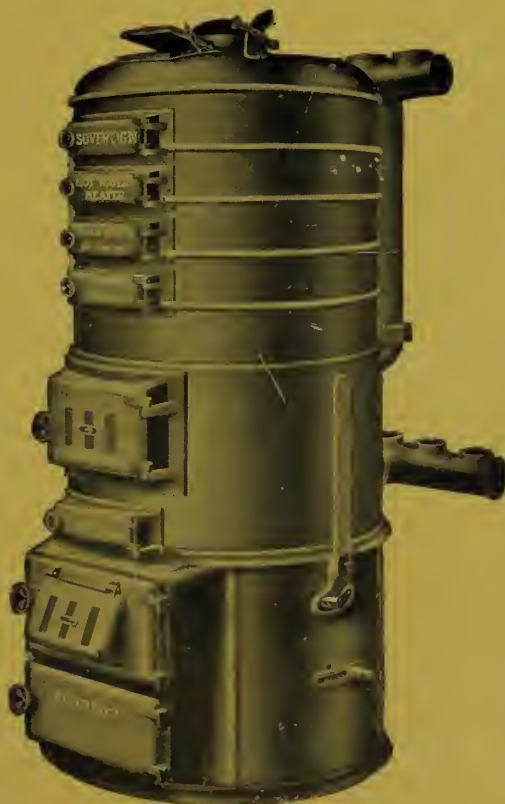
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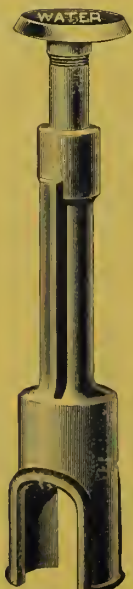
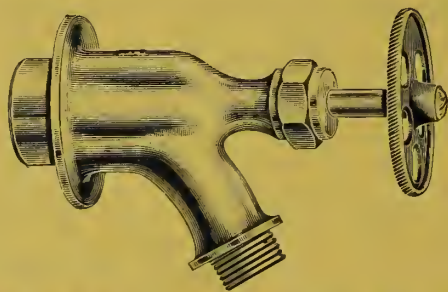
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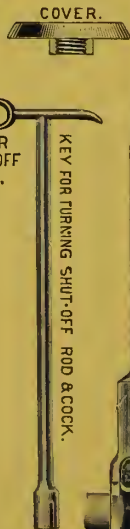
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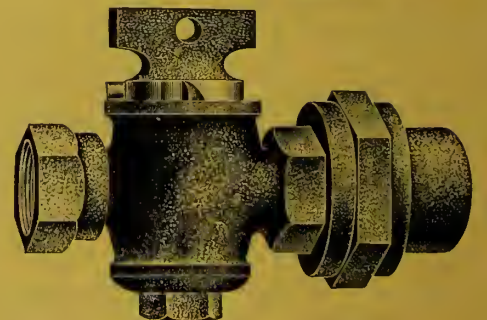


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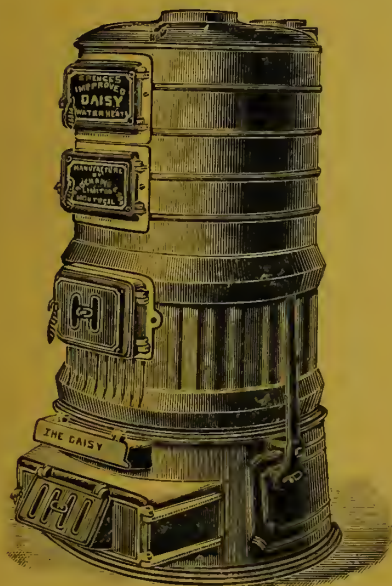
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Old Series, Vol. XX. No. 2

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There is no doubt in our mind that, if a heating apparatus is required at all, it is the intention of the home builder to provide the best that the market affords. It behooves the steamfitter, therefore, to recommend to his customer the boiler that he KNOWS is going to satisfy every requirement that is expected of it.

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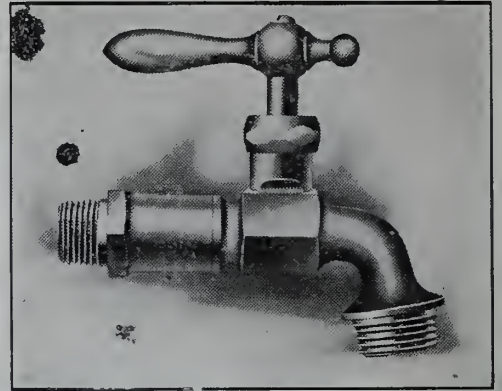
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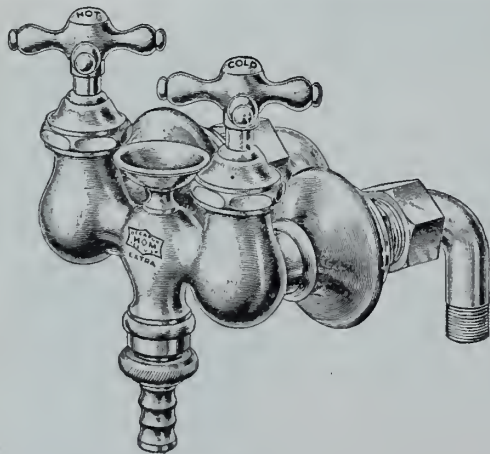
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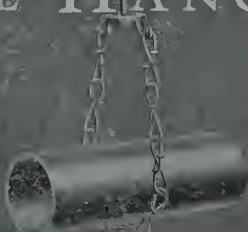
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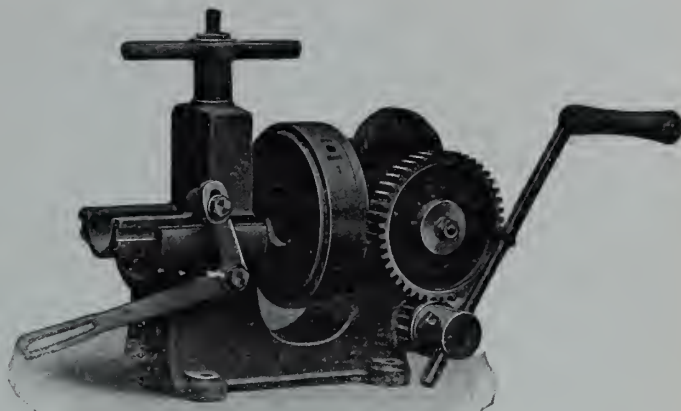
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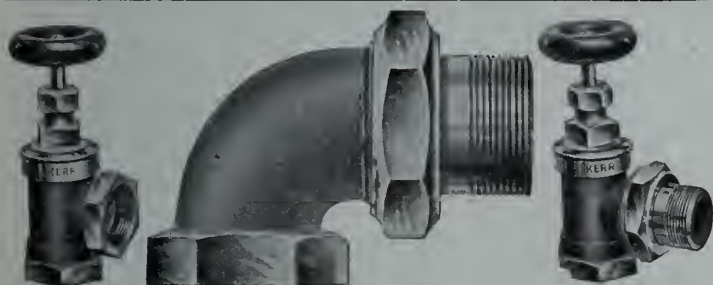
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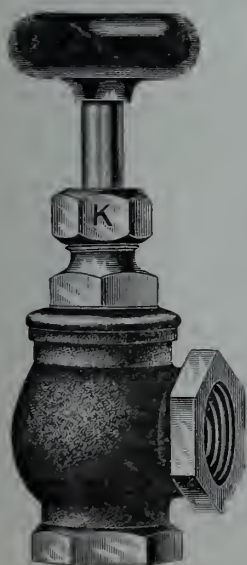
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Healthy and Diseased Plumbing

Second part of an address by Henry B. Davis, President of American Society of Inspectors of Plumbing and Sanitary Engineers, before the Homeopathic Medical Society of Washington, D.C.

Sewer Air Made Harmless.

It is also contended by its opponents that without the running trap the public sewers would be better ventilated and there would be no sewer gas or occasion to guard against it, if there were nothing to impede the free circulation of air from public sewers up through thousands of vent stacks in buildings. This is good, sensible argument, where a city is having an entire sewage system installed and new sewers placed under all houses, but I doubt its wisdom in a city where thousands of running traps are already in place, for there would not be that free circulation of sewer air and gas, except through those sewers where the traps are omitted, and the adjoining neighbors, especially in summer, would be subjected to the odors, as frequently happens now when one building is higher than the other. Many claim that there is no such thing as sewer air or gas, but that is surely a mistake, because it cannot be prevented when chemical laboratory, automobile garage, tanning factories, abattoirs, gas works, etc., discharge their waste, together with household waste, into public sewers. This accumulation of gas is shown when manhole covers are lifted into the air accompanied with loud explosions, and if there were no sewer gas why spend money trapping and ventilating plumbing fixtures, as is required in all cities, for this is done to prevent the entrance of public sewer air and that of house sewer into the premises through unsealed traps.

Traps With and Without Vents.

The 1½-in. S. and P. trap (so named because they are shaped like the two letters of the alphabet) are usually placed under and as close as possible to basins, sinks and laundry tubs, and have a water seal in the trap of about 1½ to 1¾ in. If the trap is unvented the water evaporates and breaks the water seal in about four weeks, and if vented in about two weeks, the length of time depending on season of year and temperature. While an unvented trap holds its seal longer than a ventilated trap, when not in use, it can be siphoned by having the water drained entirely out of the trap when some other is discharged or by capillary attraction, when lint or hair lies in trap with one end in the water and the other extended into the waste line.

A non-siphon trap has a large body and is so constructed as to prevent entire siphonage of water from the trap, and if self-scouring and without inaccessible hidden partitions are considered a safe trap, as it would take about fifty weeks to evaporate the water from a 3-in. trap with a 4-in. water seal. The use of this trap will considerably cheapen plumbing construction, as no vent pipe is required, and is allowed in cases where it is difficult to ventilate a fixture trap. This form of trap is used under basins, tubs, dental cuspidors and other small fixtures. However, I do

not consider it a good trap to be placed under sinks.

The water closet trap is molded within the fixture and is not visible. However, its presence is manifested by the large body of water contained in the bowl at all times, some having deeper seals and consequently a deeper body of water, which is an advantage, as there is less fouling surface in the bowl above the water line.

Ventilation of fixture traps is accompanied by a crown vent, which is rapidly being superseded by the better construction of extending the waste as a vent and by the continuous or circuit system for a number of fixtures. The objects in venting each fixture trap is not only as most persons suppose, to carry off odors, but to provide air to replace that which has been pushed ahead by the column of water discharged from a fixture, to prevent siphonage, which is draining all water from fixture traps and to prevent back pressure, both of which will break the seal of trap and allow sewer air to enter the premises.

Unused Plumbing Should Be Tested.

When a house has been without a tenant or has been closed for a long time there is always a possibility that serious defects have developed in the plumbing, caused by the opening of joints of soil, waste and vent pipes, due to settlement of the building or difference in temperature; also the evaporation of water from fixture trap is liable to occur, and shrinkage of washers and the cutting away of lead traps by rats to obtain water. These defects all endanger the health of the occupants, and no one should occupy a house under the above conditions without having a plumber make a peppermint or smoke test.

If the house were formerly occupied by persons having infectious diseases the building should be thoroughly fumigated and floors washed with disinfectants. A recent research for the cause of cancer was found in a house, other cases followed, and this is possible with other diseases, such as tuberculosis, pneumonia and children's diseases, unless the house is thoroughly fumigated as is done in Washington.

A case was called to my attention where a tuberculosis patient, far advanced with the disease, was found expectorating into a kitchen sink. Imagine others using the sink for culinary purposes! Of course, I know the bacilli of tuberculosis is supposed to be transmitted only in dry form, but who can positively say that another case could not be traced to the thoughtless use of the sink by this diseased person. This is only one case of improper use of a kitchen sink, but the average servant can be pointed out as the greatest offender in this respect, because she believes the sink can be used as a slop sink for getting rid of every possible thing that can be pushed through the strainer, including coffee grounds, particles of fat meat and vegetables, large

quantities of grease from baking pans and skillets. This and the soiled water from floor washing are emptied into the sink and sewer in large doses with no thought of the result.

Sewer Should Not Receive Refuse.

Such refuse should be carefully collected and burned or placed in a garbage pail, for no sewer will continue to do business with such treatment. Grease congeals when cold on the sides of pipe above the flow of water and gradually increases until the entire bore of the pipe is closed, causing an obstruction in many cases which can only be cured by replacing the sewer with new pipe, as was done in a case that came under my observation when 75 feet of 4-in. sewer was taken out because it was impossible to remove the grease which had congealed into a hard mass and completely filled the pipe. In this premises I saw a pan which had cooled containing grease 1 inch thick, and the cook told me she intended turning it into the sewer. I felt it my duty to tell not only her not to do so, but also the lady in charge of the institution. Such carelessness is unpardonable, for if a well-designed, ventilating grease trap, containing a large body of water having baffle plates is used for hotels, clubs and institutions, and some one is delegated and required to collect the grease daily, enough can be gathered to provide a supply of soap and besides keep the sewer clear.

An obstructed sewer is an abomination because it backs up and overflows (especially during rain) in cellars, with all its filthy accumulation, and frequently seep through walls and into adjoining premises, creating a damp and unhealthy condition liable to bring about sickness, and besides causes a great inconvenience to the occupants and annoyance from dirt, when the plumber begins work to clear the obstruction. Obstructed sewers are not only caused by grease, but often by obstructions in running trap, as mentioned before, and by tree roots gaining access to old terra cotta sewers through the pipe joints where the cement has broken away. Because of the great number of trees at the curb line in this city, and the fact most house sewers run to the front, the plumbing regulations require that cast iron be used for new work and extensions and when replacing more than 12 feet of terra cotta pipe.

Everything deteriorates with age, and systems of plumbing are no exception to this rule, so, like everything else, need attention and care, but to the layman a plumbing system, like the human system, is given little attention or thought until at last its vital parts refuse to act. Many severe cases of illness could be prevented if one but exercised sound judgment with his work, habits, eating and exercise, and the same may be said for a system of plumbing, for no sewer will act properly if the queen of the kitchen empties all sorts of greasy sub-

stances into the sink and throws rags and refuse into the other fixtures.

Diseases of Plumbing Diseases.

Large quantities of greasy food taken into the stomach bring on indigestion and derangements of the bowels, and this same treatment of a sewer brings on indigestion and constipation in the form of (obstructed sewers), often accompanied by vomiting (overflow), another ailment brought on by undigested food. This is quite a dangerous symptom and home remedies are of no use, so some kind friend runs for the doctor (the plumber) and the trained nurses (the plumber's helpers), and with all their surgical instruments, such as saw, plunger (or stomach pump), bandages (represented by pot of lead), and cast iron pipe, which takes the place of splints, proceed with diligence in their automobile (usually a one-horse team or on shank's mares) to the premises and begins on the patient. Like some doctors, there is an expression of opinion, the stomach pump (plunger) is used, and after giving advice and leaving a prescription, departs to call the next day or on an urgent telephone message when the patient is worse. Then it is seen that nothing but a surgical operation will relieve the patient, and doctor and nurses get very busy, which is demonstrated by the great amount of blood, (mud and water) the patient loses. Such an operation causes, particularly the women, considerable worry (on account of the dirt tracked through the house) and not infrequently harsh words, when the doctor informs the family there is nothing which will save the patient's life but to cut off the diseased part and graft on a new member. The only difference between the sewer and human life in such cases is the plumber is not stating what it will cost before beginning the operation; with the physician this is well known later on. The plumber doctor has the same difficulty at times in collecting his fee that the M.D. experiences, I suppose because the call of either physician or plumber could have been prevented in many cases by a little care.

The vital organs of a plumbing system are adequate water supply (the heart and arteries) or the sewer or bowels to carry off the waste matter, the ventilation system, which acts as lungs, to convey air throughout the system. Well arranged and adequate size rain leaders do the sewer what the kidneys do for the human system—flush and cleanse it. Other diseases to which plumbing is subjected are appendicitis (obstructed running trap, which can be removed without injury); constipation or obstructed sewer; nausea (obstructed overflowing sewer); congestion of the lungs (obstructed vent pipe); offensive breath (when water seal of trap is broken by evaporation); sore throat (defective trap or fixture connection); cancerous growth, tree roots in sewer; diarrhoea (leaking sewer); urinary diseases (defective down-spout connection); eczema (rust scaling of vent pipe and kitchen boilers); asthma (partly obstructed vent stacks); peritonitis (breaking down of terra cotta sewers); ruptured artery (burst water pipe); varicose vein (distention of lead water service due to water hammer), and many other body ills, for which a registered plumbing doctor should be called to insure that the work is done properly

ly and not by a sundown plumber-physician.

The inspector of plumbing and his assistants are frequently called in on complicated cases of diseased plumbing as a consulting physician, and many wrong diagnosis and grave mistakes by young plumbing doctors have been prevented by the mature experience and advice of an able corps of assistants. The office of the inspector of plumbing is an important and necessary office for all cities to maintain where plumbing is installed to protect the property owner against plumbing work being improperly performed. The work of the office forces is quietly done, and few know the importance of the office, or the amount of defective pipe, fittings, and work which is condemned and required to be replaced, or the amount of defective plumbing and fixtures required to be replaced by the service of notices on owners when they do not keep the plumbing in proper shape.

ANOTHER NEAT LETTER-HEAD.

In our last issue the letter head used by the Stevenson & Malcolm Co., of Guelph, was reproduced as a neat letter head likely to leave a favorable impression upon customers.

This week another neat specimen of

fied or they will insist that they are not getting proper ventilation." The new vessel shows the usual cowls on the uppermost deck, but these ventilate the engine-room, and have nothing to do with the cabins and saloons. The new system seems to be independent of the opening and closing of various ventilators within the passengers' reach, and its triumph seems to lie in the fact that he may open what he likes without deranging the ventilators. All the passenger cabins and saloons and the crew quarters are supplied with compressed air. In other words, the air in every habitable portion of the ship is under greater pressure than the outside atmosphere, except in the lavatories. Thus if a cabin door opens, the air rushes out of and not into the cabin. In case of the lavatories the process is reversed. The system is known as the thermo-tank system. No less than 65 of these machines are placed in different parts of the vessel. They consist of a strong metallic case containing in one part an electric fan of such power that it can pump down into the ship 4,000 cubic feet of air per minute. This means a grand total of 260,000 cubic feet of fresh sea air from the upper deck per minute. With that supply the entire atmosphere within the habitable part of the ship can be changed every four minutes. Within each of these apparatuses are a

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Another Neat Letter Head.

the printer's art is shown in the accompanying illustration, the size being considerably reduced, of course.

Other firms are invited to forward samples of their letter paper for reproduction, as by an exchange of ideas on this subject much may be gained.

THE MAURETANIA'S VENTILATION.

So much is said in the papers nowadays about each new Atlantic liner that the public comes to feel a sense of ownership in the vessels, and many persons whose sea voyages never have been or never will be farther than Coney Island become enthusiastic over speed records and are loud in their praises of the new craft. The old traveler who has crossed and re-crossed the ocean and in whose mind linger keen recollections of foul or smelly air in bad weather, ask if they "have learned how to ventilate her?" The Mauretania presents some distinct advances in this direction, which are described by the Liverpool correspondent of the *Lancet*. He notes that passengers have a propensity to open something in order to get fresh air. "They are so accustomed to open a door or window at home that when they reach a cabin their habit must be grati-

number of coils that can be filled with steam, and thus the air is warmed before it is pumped into the ship. The ventilation in no wise depends on the weather or the wind, but wholly and solely on the rapidity in the revolution of the fans. The shafts that communicate with the lavatories do not serve as inlets, but as outlets; the current is, therefore, to the lavatory and out by the shafts, and these abut into the outer funnel. Thus, the air from the lavatories is discharged into the open at the top of the funnels with the smoke. The lavatories are flushed from a large tank of sea water on the upper deck. Even in the highest closets, there is a water-head of 55 feet. The flushing is, therefore, done with great force and thoroughness. For the steerage passengers, many of whom have never seen a modern toilet, all the apparatus is arranged to work automatically, and the whole compartment containing their toilets and bath tubs is tiled and can be washed out with a hose.

C. E. Oldacre, of the Gurney Foundry Co., Toronto, is in New York, attending a convention of the American Society of Heating and Ventilating Engineers.

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WHAT PROFIT DO YOU GET?

How many master plumbers figure their profits correctly? The many failures each year show that many are not figuring on a proper basis.

When a man totals up the cost of the materials to be used on a job, estimates the time required to do the work and then adds to these ten per cent. for profit, imagining that he is going to be ahead on the job, he is working under a delusion that will be dispelled some day when the bailiff arrives and tells him to cash up or go out of business.

A man may be a painstaking journeyman, capable of doing the best possible work. He may be popular, able to make and hold friends and level headed enough to hold responsible offices in his union, and yet he may be so lacking in business

experience as to fail to see the necessity of including in the contract price of every job such overhead expenses as rent of shop (or interest on capital invested if he owns the building), advertising, bad debts, lighting and heating, office expenses and similar items. All of these items should be figured in and even then ten per cent. is not sufficient to add for profit.

Instead of figuring ten per cent. net profit, at least fifteen to twenty per cent. should be added to the gross amount if the business is to continue as a growing concern, as it must be remembered that there is much idle time during the year, and if cost of labor or material advances the master plumber and not the customer must stand the loss.

By getting together in trade associations business men gather ideas of how to figure properly on work done and they also learn the foolishness of cut-throat competition, of trying to take a job away from a competitor at a closer price. If this is done, it is logical to expect the other fellow to go you one better the first time he gets a chance, the result being a business warfare in which both business men work for the pleasure of keeping a bunch of men at work and seeing the firm's sign hanging out in front of the shop.

While travelers representing the manufacturers and supply houses can help young men in business by practical suggestions regarding business methods, the columns of the trade press are, along with the organized association work, the best place to discuss these matters. In this issue a "correspondence page" is established and the progressive men in the trade throughout Canada are invited to forward brief letters outlining their ideas regarding the percentage of profit which should be figured on, as well as any other subject relating to the business end of the plumbing and heating trade.

FALL OF WATER TANKS.

From the number of water tanks falling in the past few months there must be some radical defect in their construction or care. The first defect may be the foundation. Concrete bases should be built on a solid rock foundation, where possible, and a six to ten foot base of concrete on "hard pan" where rock cannot be reached. Hoops may not be of sufficient strength or there may be some defect in the supports or in the steel or wood of the tanks. The fall of a tank is attended with serious loss usually, and insurance companies issue booklets giving specifications for their construction and care.

The life of a wooden tank is from 12 to 30 years, but usually about 15 years,

but it must be kept well painted and filled with water. It shrinks when water gets low. One advantage of a steel tank, if paint is neglected, is that a small spot will rust through and show itself, whereas, if a wooden tank is neglected, it may burst the hoops suddenly and cause serious damage.

Hoops require special attention and removal of rust before painting. Particular attention should be given to tanks located on roofs and covered with corrugated iron. The hoops corrode very rapidly on account of the dampness held between the corrugated iron and the staves, and they may be found nearly rusted off in a few years after erection.

If the tank is left empty, the sun and rain will cause the staves to warp and twist so it will be impossible to make the tank water tight afterwards.

One new tank that fell recently was evidently due to weak supports. Another tank removed from a plant a short time ago, was found to be rotted through. Managers of factories with tanks cannot take too much care with tanks. They cannot last forever, and careful inspections should be made each week.

It is false economy for a manufacturer to cut a builder of tanks to the last cent and think he is saving money. The structural work must be of the best, and the supports sufficiently strong. The builders are working with formulae that are more or less in error as in any structural steel work. A large factor of safety must be allowed to obtain supports to hold the load upon them. The supports, too, must be carefully shielded from the weather and the workmanship must be done with great care. Otherwise there will be more tales to tell of fallen tanks.

THE METAL SITUATION.

With the turn of the year the leading metals show a gratifying strengthening movement, and although it would be foolish to indulge in too roseate a vision as to the development of that movement, the present situation offers sufficient grounds to warrant the opinion that the markets are now, at all events, resting on a more solid basis than at any time since the great decline. And that is something, after these many days of storm and stress, for which to be thankful. The merchant, wise in his experience, does not wish to see any great boosting of prices, although it might bring grist to his mill. He has no desire to undergo, just for a while, the painful process of being pushed down a precipitous hill with a heavy load of stock on his back. He realizes that an

undue inflation of prices would assuredly bring a similar reaction in its train.

The stronger the foundations, the greater the stability of the house, and the slower the recovery of the markets the greater the chance of permanent strength being imparted to them, in so far as permanency can be applied to anything which has to depend upon the variableness of supply and demand. The

ward tendency, so that the metal markets shall settle themselves down to that solid prosperity which we believe awaits them.

Could we be assured that the vast amount of copper which has been exported within the last few months to Europe from the States has really been

GIVE HIM A CHANCE!

Have you in your employ a young man whose ambition is to learn the plumbing trade and perhaps some day become a master plumber?

Give him a chance! Not in any one specific thing, but make it a creed to be become a master plumber? asks Modern Sanitation.

You may send him out on a job tomorrow, and even though he has his heart and soul in the work, he makes a mistake. Possibly he deserves to be disciplined—but give him a chance! Find a way of pointing out his mistake

him what to study and observe in order that he may improve. Many young men are satisfied to have the employer's obligation end with the pay envelope and are apt to resent advice, but like many other things, the habit of receiving and heeding it can be acquired, particularly if there be confidence in the employer, and this depends almost altogether upon the employer's attitude toward the employee.

Much is to be gained on both sides; the employee will be a better mechanic and business man, the employer will achieve greater financial results and both will be happier; so make it your creed to give him a chance!

A GOOD EXAMPLE.

The Saturday Evening Post, of Philadelphia, is setting a good example to the business community of America. All through the recent financial flurry it preached confidence and hope. Now its publisher, Cyrus Curtis, has followed up preaching by practice, and to show that he believes in the solidarity of conditions in general he has spent fifty thousand dollars in advertising the Christmas number of the Post. This is a splendid example and one that might with advantage be followed by other



ALD. HARRY MAHONEY,

Of Mahoney Bros. Master Plumbers, of Guelph, elected Alderman for 1908.



COUNCILLOR WM. LINTON,

Representing the Standard Ideal Co., Ltd., Elected to the East Toronto Municipal Council for 1908.

metals, and especially so in the case of copper, are not, apparently, being stiffened under a great inflation in the demand, although the call, both domestic and foreign, is brisker day by day. An analysis of the circumstances directly influencing the markets seems to show that the advance is due more to the improved financial conditions in Europe and the American continent, and to a return, in some degree, of confidence in the future.

Supplies are short in most of the metals, and, therefore, the danger of an abnormal demand has to be faced. Manufacturers, however, will not be in a hurry to buy too extensively, and, as the freeing of money will not be rapid, there should be a checking tendency for some time to any big speculative movement. Nothing, however, is to be gained by anticipating trouble. Sufficient it should be that producers generally are trying by curtailing production to keep prices at a steady level with a slight up-

in such a manner that he will not let it occur again. You may have made the same mistake yourself, but now you know better. Out of your experience teach him to know better.

Your young man may be acquiring a knowledge of the mechanical end of the business, but giving little or no thought to the theoretical and administrative end. Take a moment now and then to coach him on these matters as well. Advise him to spend some of his spare hours in study and observation—tell



ALD. NORMAN CLARK,

Of Adam Clark & Son, Master Plumbers, Hamilton, re-elected Alderman for 1908.

publishers and other business houses. Instead of accepting the words of the blue-ruin shouters, and believing that calamity awaits the business world, show people that this idea is wrong and set an example of courage and hope.

Determining Amount of Radiating Surfaces

Simplified Methods of Estimating Hot Water Radiation—An Easily Understood Explanation Illustrated by Charts—Written for this Paper by C. E. Oldacre, Toronto, and continued from our last issue.

In the first place we have considered the requirements of corner rooms with outside temperatures of zero, 10 degrees below, 20 degrees below and 30 degrees below zero, with an inside temperature of 65 or 70 degrees Fahrenheit being continually maintained. It has been assumed in these cases that adjoining rooms or rooms that may be situated over such corner rooms are also heated

required temperature. The temperature of the surrounding space and the degree of protection afforded the outside walls need be carefully taken into consideration in making any calculations for the determining of the radiating surface required to maintain any given temperature, and many seeming discrepancies in calculations will be often found directly traceable to the non-observance of

ate factor in arriving at the proper amount of heating surface that will be required to properly heat any given space. It is to be expected that such windows or doors are reasonably tight-fitting, otherwise a larger proportion of heating surface will be required to accomplish the work.

Where rooms are provided with open fires or fire-places there will be a more frequent change of air than where they are not so provided. Fire-places are a most desirable and useful adjunct of any house for many reasons, but they should always be provided with dampers in the throat so that an excessive amount of heated air will not be removed from the room when the fire-place is not in operation.

As noted, the rooms of a house or building will vary in size, shape, and dimensions, and the amount of exposed wall surface, and this will greatly vary the amount of heating surface that will be needed. Taking the case of a room cited that is 20x20 feet, with a 10-foot ceiling, having 4,000 cubic feet of contents, situated at the corner, we have seen that the equivalent glass surface (E.G.S.) of this room will be equal to 320 square feet, and that 128 square feet of hot water radiating surface will be required to maintain 70 degrees Fahrenheit in the room when the temperature of the outside air stands at zero.

Let this room of 4,000 cubic feet contents be one that is exposed on only one side and perfectly square, then we would have a room which would measure 20x20x10 feet. The room has one side exposed to the north or west. It is to be

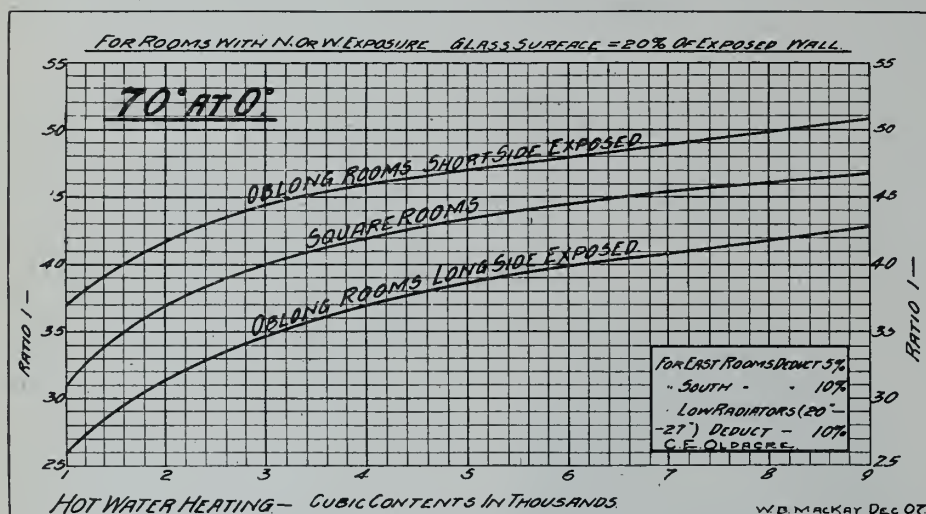


Chart V.—Showing amount of hot water radiation required for inside rooms. Inside temperature 70 degrees Fahr.; outside, zero; water, 180 degrees.

to a like degree, and if the rooms are on the ground floor that they are over a cellar where the temperature does not drop below freezing (32 degrees Fahr.). Should the adjoining rooms or the space over the room in question be unheated or the cellar unusually cold, or the floor of the room not well protected, then an additional amount of radiation will be required to properly do the work. An allowance for this extra exposure will need to be made in proportion to the greater or lesser extent of such exposure. Rooms through which chimney flues that are in use pass will necessarily require less heating surface to maintain any given temperature than those not so provided. There is always a transference of heat from a body of higher temperature to one of a lower temperature, the extent of such transference depending upon the difference of temperatures and the amount of surface. The greater the difference in temperature between the hot and the cold body and the larger the amount of surface the greater will be the quantity of heat transferred.

The lower the temperature of the space adjoining the room that is to be heated the greater will be the heat loss from the room, and the larger will the radiator need be to heat the room to the required temperature. On the contrary the more protected, and the higher the temperature of the adjoining space the less will be the radiating surface required to heat the room to the

this important factor. When doors enter immediately into the room that it is desired to heat, then these should be counted as of the same cooling effect as

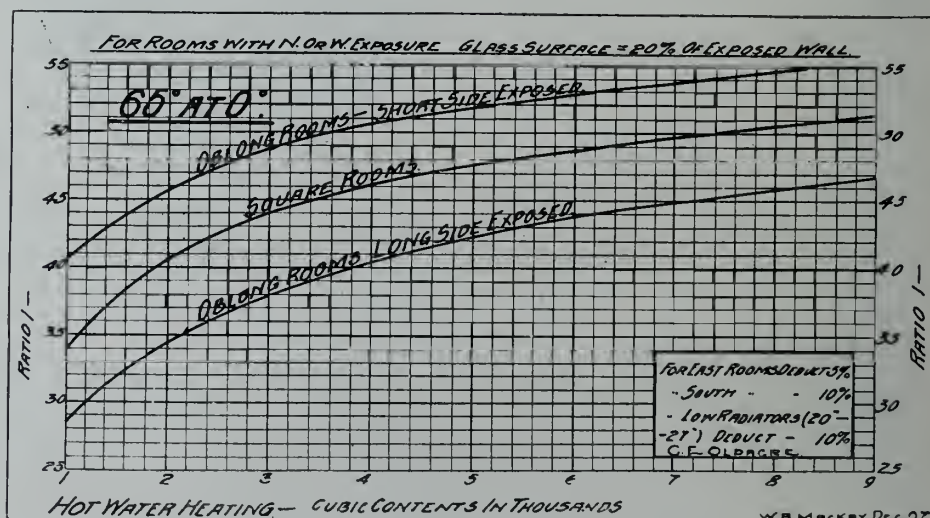


Chart VI.—Showing amount of hot water radiation required for inside rooms. Inside temp., 65 degrees Fahr.; outside, zero; water 180 degrees.

are windows. As has been previously stated in calculating the radiation for a room, the loss due to the leakage of air around the windows and doors is an element which often does not receive due consideration, and is the one indetermin-

heated to 70 degrees Fahrenheit when the temperature outside stands at zero, with the water at 180 degrees. Twenty per cent, or one-fifth of the exposure is glass. The exposure in this case would be 20x10 feet, or 200 square feet,

of which one-fifth, or 40 square feet, is glass, having 160 square feet of wall surface. Dividing the wall surface by four gives us 80 square feet of equivalent glass surface. Dividing 4,000 by 25 (allowing for two changes of air per hour) gives 160 square feet of equivalent glass surface. Dividing the difference between the inside and outside temperature (70 degrees—0 degrees) by the difference between the temperature of the water and the air of the room (180 degrees—70 degrees equals 110 degrees) multiplied by 1.6 (the heat radiated per square foot of heating surface per hour per degree of difference in temperature) gives a factor of .4 for 70 degrees Fahrenheit inside and zero outside. The above is expressed in an

equation, thus $\frac{70-0}{(180-70) \cdot 1.6} = .4$. This would be expressed generally for any temperature $\frac{t-t'}{(T-t) \cdot a}$ equals F where

t is the required temperature, t' the temperature of the outside air, T the temperature of the radiating surface, and a is the heat given off per square foot of heating surface per hour per degree of difference in temperature. F represents the factor for any given temperature under the determined temperature conditions for the inside and outside air and of the water in the radiators. It is the amount of heating surface in decimal parts of a square foot that will be required at the various outside temperatures stated, for each square foot of glass, or of equivalent glass surface, to maintain the determined temperature inside the room, with the water at the given temperature.

Then adding together 40 and 40 and 160 gives us 240 as the E.G.S. and multiplying this by .4 gives us 96, or 96 square feet of radiation required to maintain seventy degrees Fahrenheit in

of heating surface to each 42 cubic feet of contents.

If we refer to Chart V, we will see the vertical line representing 4,000 cubic feet intersects the curve marked "square rooms" on the horizontal line marked 42, so dividing 4,000 by 42 gives us the required radiation, or 95+, or 96 square feet, for a room having a west or north exposure, with one side exposed, and not to exceed 20 per cent of the exposure is glass surface. If 65 degrees Fahrenheit, with zero outside, was desired, we would take Chart VI, and there would find that for the same square room as above described there would be required 87 square feet, as the 4,000 outside line intersects the curve for square rooms on the horizontal line 16, hence 4,000 divided by 46 equals 87,

equals F, gives us the following values for F at various temperatures:

HOT WATER.

Value of F for direct radiators at various inside and outside air temperatures, and different water temperatures, co-efficient transmission 1.6.

Temperature air outside deg. Fahr.	Temperature room deg. Fahr.	Temperature of water deg. Fahr.	160	170	180	190
-30	70		.7	.625	.57	.52
-30	65		.628	.565	.516	.475
-20	70		.625	.562	.51	.47
-20	65		.586	.506	.462	.425
-10	70		.555	.50	.454	.416
-10	65		.50	.445	.407	.375

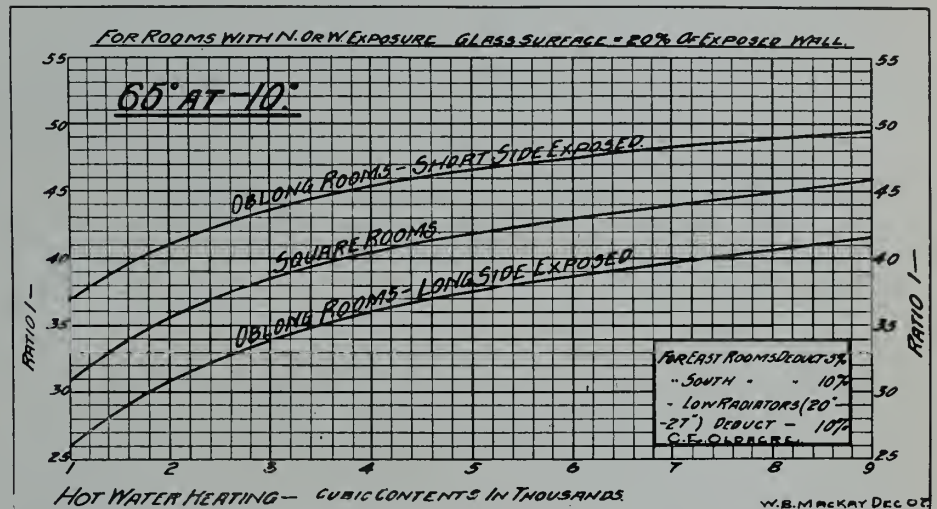


Chart VIII.—Showing amount of hot water radiation required for inside rooms. Inside temp., 65 degrees Fabr.; outside, 10 below zero; water, 180 degrees.

or 87 square feet of radiating surface to maintain 65 degrees Fahrenheit with an outside temperature of zero, where the room has an outside wall exposure of one side and not to exceed 20 per cent:

0	70	.47	.437	.40	.364
0	65	.427	.4	.353	.325
+10	70	.41	.38	.34	.317
+10	65	.363	.32	.30	.275

The above is applicable to standard height—(37 to 39 inches)—cast iron radiators, but with low radiators on account of the higher co-efficient of transmission the factors would be smaller, and with wall radiators still smaller, as has been noted.

After reducing the glass and wall surface and the cubic contents to equivalent glass surface, as has been noted, then multiplying the equivalent glass surface by the factors as above, according to the prevailing outside and desired inside temperature conditions will give the necessary amount of hot water heating surface for any particular case, to and from which additions and deductions are to be made according to the character of radiation, as above, that is used and its location.

Further, considering the variation in exposed wall surface of rooms and the difference it will make in the required radiating surface, take an oblong room of 4,000 cubic feet contents where the length of the exposed side is twice as great as the depth or width of the room with a 10-foot ceiling, and we have a room which is approximately 14.1x28.6x10 feet. It is to be heated to 70 degrees when the outside temperature stands at zero. The water is to be considered at 180 degrees Fahrenheit. The exposed wall in this case will be 28½x10 equals

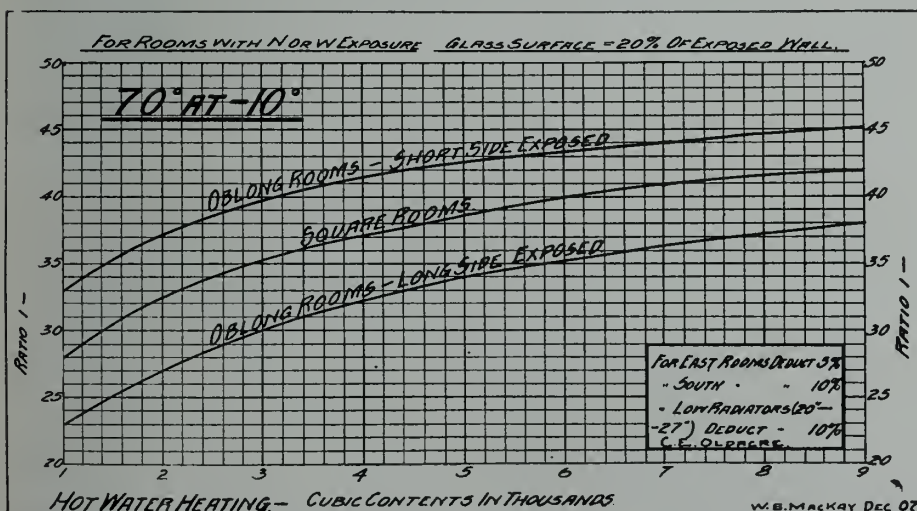


Chart VII.—Showing amount of hot water radiation required for inside rooms. Inside temp., 70 degrees Fabr.; outside, 10 below zero; water 180 degrees.

the room of 4,000 cubic feet when the temperature is zero outside, where the room is square and has only one wall exposed and not to exceed one-fifth of this exposure is glass. This corresponds practically to a ratio of one square foot

of this exposure is glass surface, the adjoining rooms being heated to a like degree.

Note 2—Using the formula $\frac{t-t'}{(T-t) \cdot 1.6}$

285 square feet, and of this one-fifth, or 20 per cent., is glass surface. The glass surface then will be one-fifth of 285 equal to 57 sq. feet. Reducing the wall surface to E.G.S. we have 285-57 equals 228, and dividing 228 by 4 gives 57 square feet of equivalent glass surface. Dividing the cubic contents-4,000-by

heated to 70 degrees Fahrenheit when the outside temperature is at zero and with the water at 180 degrees.

The exposed wall surface in this case will be 14.1x10 equals 141 square feet and of this one-fifth, or 20 per cent., is glass surface. The glass surface will then be one-fifth of 140 square feet,

216 E.G.S. Then multiplying 216 by .4 gives 86.4, or practically 86. Hence 86 square feet of hot water radiation would be required to maintain 70 degrees Fahrenheit in the room of 4,000 cubic feet when the outside temperature stood at zero, where the room has one side exposed, and this exposed side is one-half the length of the other dimensions and one-fifth of the exposed side is glass surface. This corresponds practically with a ratio of one square foot of heating surface to 46.5 cubic feet of contents.

Again referring to Chart V., which covers such cases, we will see that the vertical line representing 4,000 cubic feet intersects the curve marked "Oblong Rooms-Short Side Exposed," on the horizontal line marked 47, so dividing 4,000 by 47 gives us the result 85, or 85 square feet as the amount of hot water radiation required for a room having a north, or a west exposure, where the room has one exposed wall, which is one-half the length of the other dimension, with one-fifth of the exposure glass surface, and where it is required that 70 degrees shall be maintained when the outside temperature stands at zero.

Likewise, if 65 degrees inside with zero outside is desired, we refer to Chart VI. and we will find by the same process that 80 feet will be required. We have seen that the same amount of cubic space under varying conditions of exposure even with the same outside temperature prevailing, will require widely varying amounts of heating sur-

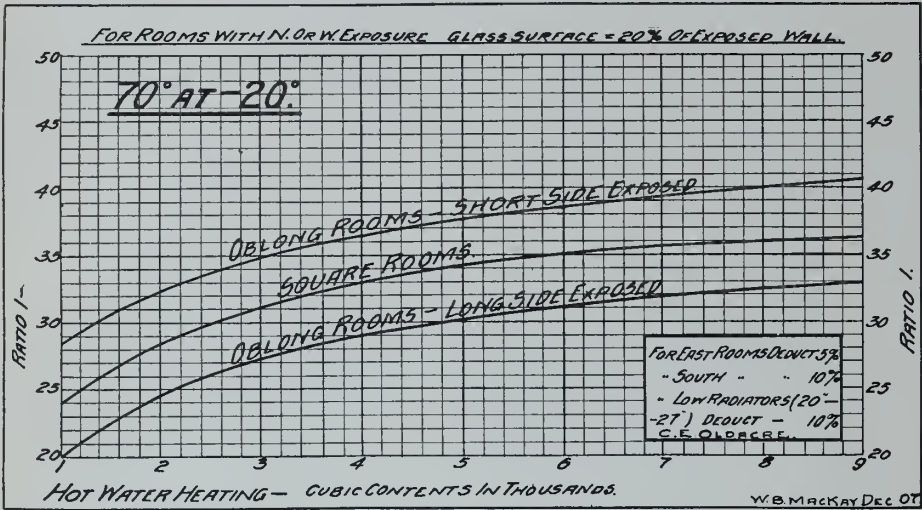


Chart IX.—Showing amount of hot water radiation required for inside rooms. Inside temp., 70 degrees Fahr.; outside, 20 below zero; water, 180 degrees.

25 gives us 160 E.G.S. Adding 57, 57 and 160 we have as the total E.G.S. 274. Then multiplying 274 by .4 gives us 109.6, or practically 110. Hence 110 square feet of hot water radiation would be required to maintain seventy degrees Fahrenheit in the room of 4,000 cubic feet when the outside temperature stood at zero, where the room has one side exposed, and this exposed side is twice the length of the other dimensions and one-fifth of the exposed side is glass surface. This corresponds practically with a ratio of one square foot of heating surface to 36.4 cubic feet of contents.

If we refer again to Chart V., which covers such cases, we will see the vertical line representing 4,000 cubic feet intersects the curve marked "Oblong Rooms-Long Side Exposed," on the horizontal line marked 36.5, so dividing 4,000 by 36.5 gives us the required radiation, or 110 square feet for a room having a north or west exposure where the room has one exposed wall twice the depth or width of the room, with one-fifth of the exposure glass surface, and where it is required that 70 degrees shall be maintained when the temperature outside stands at zero.

If 65 degrees Fahrenheit with zero as the temperature outside was desired, then we take Chart VI. and there we see that for the same room under similar conditions that there would be required 100 square feet of radiation, as the vertical line for 4,000 cubic feet intersects the curve for "Oblong Rooms-Long Side Exposed," on the horizontal line marked 40. Hence 4,000 divided by 40 equals 100, or 100 square feet of heating surface to heat this room to 65 degrees Fahrenheit, when the outside temperature stands at zero, with the water at 180 degrees.

Further illustrating the variation in required heating surface according to the extent of the cooling surfaces, take the room 14.6x28.6x10 feet, with only one of the short-sides exposed. As before, we will consider that it is to be

equals 28 square feet. Reducing the wall surface to E.G.S., we have 140-28, equals 112, and dividing 112 by 4 gives us 28 square feet of equivalent glass sur-

Table showing comparative amount of hot water heating surface. Water 180 degrees; room of 4,000 cubic feet contents; outside, zero; glass surface, one-fifth total exposed wall.

	Inside temp. erature	Sq. ft. heating surface.	Ratio of 1 sq. ft. to cubic contents
Corner room, 2 sides exposed	70	130	31
Corner room, 2 sides exposed	65	121	33
Oblong room, long side exposed	70	110	36.4
Oblong room, long side exposed	65	110	40
Square room, one side exposed	70	96	42
Square room, one side exposed	65	87	46
Oblong room, short side exposed	70	85	47
Oblong room, short side exposed	65	80	50

face. Dividing the cubic contents-4,000 -by 25 gives us 160 E.G.S. Adding together 28, 28 and 160 square feet gives

face. The variations in amount of heating surface for the same amount of cubic contents, under like conditions of

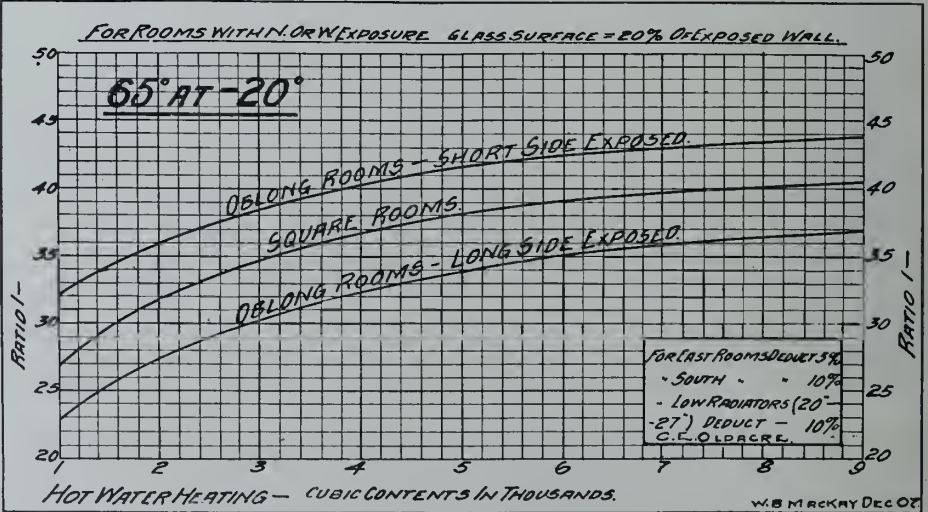


Chart X.—Showing amount of hot water radiation required for inside rooms. Inside temp., 65 degrees Fahr.; outside, 20 below zero; water, 180 degrees

outside temperature prevailing in each case is illustrated in the foregoing table:—

The table of comparative amount of heating surface No. 4 shows the wide variation in the relation of the amount of heating surface to cubic contents and explains the unreliability of calculating heating surfaces by a fixed percentage of the contents or a set ratio of heating surface to cubic contents without reference to the varying heat losses that take place through varying amounts of wall and glass surface and changes of air. In the table we have 1,000 cubic feet as the contents, zero outside and 70 degrees inside, yet in one case we have 130 square feet as the required amount of heating surface, and in another 85 sq. feet, or over 30 per cent. less than in the first case. In the first case we have one square foot of heating surface for every 31 cubic feet of contents, and in the second case we have one square foot of heating surface for every 47 cubic feet of contents, and if the case of a room of 1,000 cubic feet is taken under similar conditions, situated with a north and west exposure, then the relation of the heating surface to the cubic contents would be 1 to 21.

From this we see that in determining the proper amount of heating surface for a particular case it is first necessary to determine the heat losses and proportion the radiation accordingly, and the nearer we approximate the heat losses from the various sources, the more correct will be the allotment of any particular amount of surface.

Charts VII., VIII., IX., X., XI., XII. are to be used in the same way as the preceding, according to the temperature inside and outside. Charts VII. and VIII. being for 10 degrees Fahr. below zero outside; charts IX. and X. for 20 degrees Fahr. below zero outside, and charts XI. and XII. for 30 degrees Fahr. below zero outside. It is to be noted that in all of the foregoing no allowance has been made for double windows, as the degree of their tightness and the manner of their fitting is quite variable, the value of double windows depending very largely on the closeness with which they are fitted. Also, it is to be noted that in all cases two changes of air are calculated, and as has been stated, this is a somewhat variable factor according to the difference in building construction, decreasing with

the extent of wall exposure for rooms of equal cubical contents, and also as the ratio of wall exposure to cubic contents increases, that is, the change of air will be greater in small rooms than in large rooms under identically similar conditions.

It has been seen that wall radiators

cent.; from $4\frac{1}{2}$ to $5\frac{1}{2}$ meters (14' 9 1-6" to 15' 5 per cent., and over $5\frac{1}{2}$ meters (18 feet). 10 per cent is to be added to the total heat losses.

Meaford is to build a town hall to cost \$15,000.

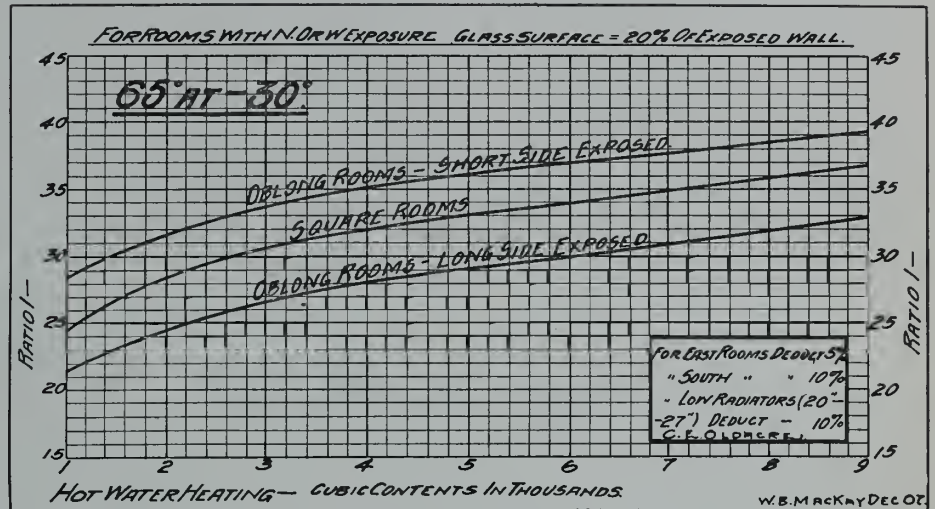


Chart XII.—Showing amount of hot water radiation required for inside rooms. Inside temp., 65 degrees Fahr.; outside 30 below zero; water, 180 degrees.

are more effective than the standard cast iron radiator, that is, the amount of heat given off per square foot of surface is greater. The same applies to wrought iron pipes coils; their effectiveness being greatest where the fewest runs of pipe are used, and decreasing as the number of runs are increased.

Radiators that are concealed or semi-concealed (such as radiators recessed in walls) are not as effective as ones that are set free. It will be found that from 10 to 20 per cent. more radiation will be required where radiators are recessed than is ordinarily calculated for free standing radiation.

Rooms that have extra high ceilings require a larger amount of radiation than rooms having the average ordinary ceiling of 9 or 10 feet height. It is stated by Hugo Freiherrn von Seiller in "Die Zentralheizung," Vienna, 1903, that the following additions should be made: For ceiling heights from 4 to $4\frac{1}{2}$ meters (13' 1 $\frac{1}{2}$ " to 14' 9 1-6"), 3 per

DISPOSAL OF GARBAGE.

The current number of Chambers' Journal describes an ingenious machine, which has been devised and is now being experimented with by one of the London, Eng., borough councils, to "turn garbage to a more profitable account in a hygienic manner." This apparatus combines the three operations of disintegrating, pulverizing, and mixing in one. The assorted garbage is discharged into a hopper through which it falls into a small compartment in which revolve four fifty-pound hammers at a speed of 1,250 revolutions per minute. This is equivalent to 5,000 strokes for a cumulative weight of over 250,000 pounds per minute, irrespective of the impetus produced by the centrifugal force of the machine.

Under this treatment the incongruous mass of rubbish and filth is turned out of the machine in one operation in the shape of a uniform black mould. Bottles, ashes, slates, vegetable refuse, and other garbage are completely reduced to powder in the apparatus, and so assimilated and intermixed as to constitute a new substance of great value. It is claimed that the plant occupies little space, and can deal with about five tons of garbage per hour, thus rendering the operation very cheap. It is also claimed to be entirely hygienic, as there is no dust, smoke, or noisome effluvia.

The manure thus obtained is said to be entirely odorless and extremely valuable as a fertilizer. There is naturally a keen demand for such manure, and it is stated that the municipality where this destructor is in operation obtains substantial profits from the sale of the product.

The assets of Oscar Daoust, plumber, Montreal, recently declared insolvent, realized by public auction the sum of \$301.91. This included book debts listed at \$636.92. A claim of \$1,016 for work done on a certain building was not offered for sale.

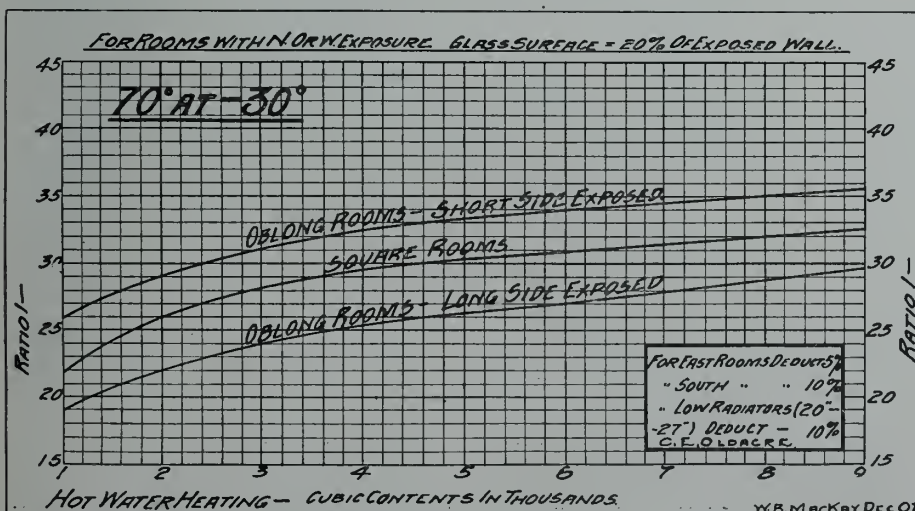


Chart XI.—Showing amount of hot water radiation required for inside rooms. Inside temp., 70 degrees Fahr.; outside, 30 below zero; water, 180 degrees.

Modern Conveniences for Farm Homes

The Eighth of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

EXAMPLES OF HOMES.

From the many country homes where advantage has been taken of improved appliances for comfort and the saving of labor a few have been selected as illustrations of the cost of introducing such conveniences. The cost has been furnished in each case by the owners.

One two-storey house of 8 rooms has a hot-air furnace, with registers in 7 rooms. A range was used in the kitchen, so no other heat was needed there. The furnace was furnished and installed for \$150. The cost of the coal used in both range and furnace has averaged about \$54 a year for the last four years. The following plumbing fixtures were set up, with complete supply and waste pipe connections as far as the outside of the house, for \$180: In the bathroom, lavatory, bath tub, and water-closet; a lavatory in one bedroom; in the kitchen a sink and a 30-gallon range boiler; a cold water faucet in the laundry, and a sill cock for the hose outside the house.

A six-room cottage has a hot-air furnace, with registers in every room, which was furnished and installed for \$133. From two rooms the heat is shut off part of the time, and coal is not used in the kitchen range. The cost of the coal per year has been \$36. Water is supplied to the plumbing fixtures through a tank in the attic. The cost of the attic tank, the bathroom fixtures, which consist of bath tub, lavatory, and water-closet; the kitchen sink and hot-water heating tank, with connections to walls of house, was \$115.

A home in central Iowa has a pneumatic tank 8 feet long and 30 inches in diameter in the cellar. This tank is supplied with water and some air by a windmill, erected in common with two neighbors. There is in the cellar a smaller tank of 66 gallons' capacity, connected by a hand force pump to the rain-water cistern. Three or four minutes' pumping with the hand pump every day supplies a good pressure on the cistern water. The soft water tank supplies a 30-gallon hot-water boiler, which is connected with a hot-water coil in the furnace and with a gasoline heater in the cellar. The plumbing fixtures consist of a sink in the kitchen and a bath tub, lavatory, and water-closet in the bathroom. Each fixture has three faucets, containing, respectively, cold well water, cold cistern water, and hot cistern water. The three pipes are run to the laundry and faucets set. The cost of the entire plumbing, including connections to windmill and to rain-water cistern, hand pump for cistern, steel tanks and all, but not including a share of the windmill and deep well, was \$300. The heating system consists of a hot-air furnace, with registers in every room, there being nine rooms and halls in the house, including kitchen and third-storey room, and cost \$200 to install. The average cost of fuel per year is \$75.

A five-room cottage is heated with a hot-water system installed by the owner. The cost of material and fittings was under \$200. In four years the additional cost for repairs has been \$20.65. The whole house is kept at about 70 degrees Fahr., and the cost for soft coal has never exceeded \$38.50 for the whole firing season.

The advantage in the hot-water system is in the fact that the water begins to circulate through the pipes as soon as the fire is built and the radiators will retain heat from five to ten hours after the fire is out.

The first-floor rooms of one home are heated by using a large wood stove in the cellar. This stove is large enough to take cord wood in full length. It is walled in with brick, and pipes lead from this hot-air chamber to the various rooms. This method gives "splendid satisfaction."

A furnace with six registers was put into an old two-storey house at a cost

bathroom and the sink and 30-gallon hot-water boiler in the kitchen. The boiler is connected to a water back in the kitchen range and hot water is piped to the kitchen sink, to the bath tub, and lavatory. One line of soil pipe collects all the liquid wastes. About 10 feet outside the foundation wall this cast iron soil pipe connects to a 4-inch vitrified pipe sewer, leading to a 50-gallon settling chamber, 75 feet from the house. The effluent from the settling chamber is emptied into a line of 4-inch drain tile laid with open joints and with a very slight fall, about 10 inches below the surface of the ground.

BUILDING NOTES.

A Grossman, Vancouver, will build an office building to cost \$75,000.

During 1907, buildings, public and private, were erected in Calgary to the value of \$2,000,000.

St. Helen's church (Roman Catholic), Toronto, has taken out a permit for a brick and stone church to cost \$50,000.

During 1907 there were 296 buildings erected in Peterboro, at a cost of \$761,320.

William Nicholson, Wingham, has secured the contract for the new post office at Kincardine, the price contracted for being \$18,000.

Edmonton shows an increase in building for 1907 of about \$500,000. The money stringency, no doubt, affected building in the west last fall.

George Henry, Toronto, has contracted to have the addition to the Toronto post office completed by October. The cost will be in the vicinity of \$20,000.

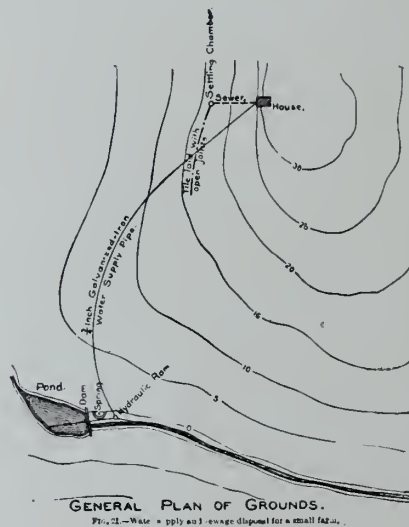
Building permits issued in Calgary during 1907 showed an increase of about one million dollars over 1906. The figures as submitted by the building inspector are: In 1906, \$1,109,166; in 1907, \$2,094,264.

Permits were taken out in Ottawa during 1907 for new buildings of the aggregate value of \$2,364,950, an increase of over half a million as compared with 1906. The total number of buildings erected last year was 355.

The Toronto Christian Scientists have purchased a site for their proposed new temple, which will cost in the neighborhood of \$150,000. The plans have not been taken up to date, it being understood that building will start in the spring.

W. W. Near, president of the Page-Hearsey Iron Tube & Lead Company, Toronto, states that no additions will be made by his company to the plants at Guelph and Welland at the present time.

The company may issue new stock to the amount of \$1,500,000 some time during the year, making a total of \$3,500,000, but at the present time the increased capitalization authorized is not to be used.



of \$125. One of the old chimneys was used for a fireplace. The grate and the tile front cost \$17, and a carpenter put in the wooden frame and mantel shelf for \$10. The cost of the coal per year is from \$43 to \$50.

Figure 21 shows a plan of the water-supply and sewage-disposal system for a cottage near Chappaqua, N.Y. By building a stone dam about 30 feet long, a brook was made to give a head of 6 feet 2 inches for a compound ram located a few feet below the dam. The water from above the dam flowing through the drive pipe forces spring water through 650 feet of 3-inch pipe to a 65-gallon galvanized iron tank in the attic of the cottage, at an elevation of 87 feet above the ram. The overflow from this tank wastes into the drain for the rain water leaders. Water is piped from the attic tank to the bath tub, lavatory and water-closet tank in the

Correspondence Page

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

Two Pipes for One Chimney.

A correspondent at Rodney, Ont., writes: "As you are giving us the opportunity to ask all questions in the line of heating and plumbing, I would be pleased to get some advice.

"We have installed a furnace this fall and once in a while the check damper and the cap that is in the end of the 'tee' just as it leaves the furnace will blow out, making a report like a gun. As soon as you open the furnace door it gushes out about two feet and then it is all right again. The chimney has a 7-inch hole about 8 feet above where the furnace pipe enters. The cook stove pipe enters in the above hole. The furnace pipe has one elbow and the stove a bevelled elbow. It is a combination furnace, but they are burning wood in it."

Answer.—What seems to be the trouble here is that there are two connections to the same chimney, that is, the smoke pipe connections from both the furnace and the kitchen range or stove both enter the same chimney, thus providing a defection draft. The cool air enters through the stove and its connections when it is not in active operation and becomes a check on the draft from the furnace. The phenomenon spoken of is a perfect proof of an insufficient draft for the furnace and the incapacity of the chimney flue to carry off the accumulated gases.

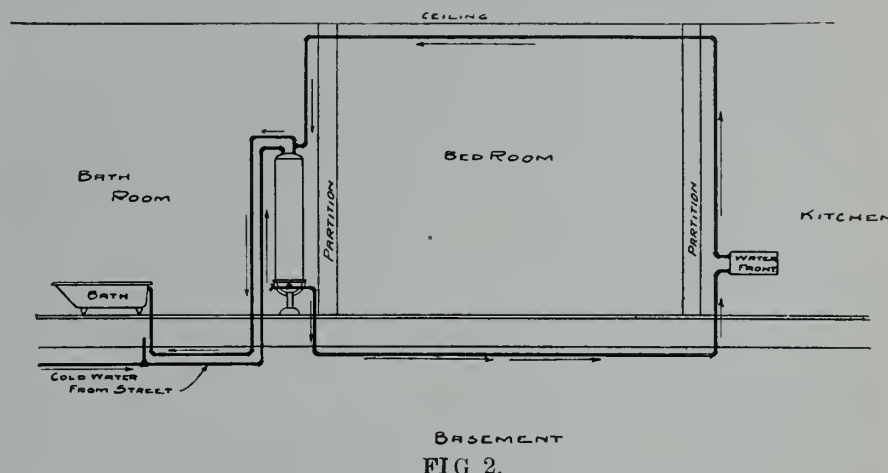
As we are not informed as to the size of the chimney or its surrounding conditions, we cannot say that the chimney is too small for the furnace by itself, or whether the draft is also affected by untoward circumstances, so that even if the range were disconnected, the

their owners, due to no other cause than poor drafts from faulty chimney connections. To obtain good results from a stove or furnace they should in all cases be connected to separate chimney flues of ample size and good

Range Boiler Connections.

A Kincardine correspondent writes, stating that he has installed a bathroom outfit to which he cannot get a sufficient supply of hot water. The building is a one-storey cottage and as there is no room for the boiler in the kitchen it has been set in the bathroom. He asks how to change the pipes to make the boiler do its work, leaving it in the same position.

Answer.—The arrangement of the stove, circulating boiler and the piping



construction, and in no case should they be of a smaller size than 9x9 inches and increasing in size according to the size of the firebox of the apparatus to which they are connected. The larger the firebox the larger will be the size of the chimney that will be required to give proper results.

We cannot too strongly impress on our readers the necessity for the strict observance of the above simple requirement, if annoyance from improper working ranges, stoves and furnaces is to be

as indicated by our correspondent is shown in Fig. 1. Such an arrangement would be defective, both as regards the circulating pipes connecting the water front of the stove to the boiler and also the connection for the hot water supply from the boiler to the bath tub. In the first plan there would be little or no tendency for the circulation of the water between the stove and boiler due to the arrangement of the pipe connecting the bottom of the boiler and the bottom connection on the water front, and in the second place the connection at the side of the boiler leading to the bath tub is wrong, as no hot water could be drawn from the boiler until the entire contents of the boiler were heated to a point below this connection, and then only as much hot water could be drawn as lay below this point, and if the drawing of water was continued after such hot water was exhausted then only the cold water would be had at the top.

A better plan for the arrangement of the piping is shown in Fig. 2. In this case the pipe leading from the bottom connection on the water front to the bottom of boiler would be run along the ceiling of the cellar and if there was no cellar then this pipe would need be carefully wrapped with a good non-conductor and tightly boxed to prevent freezing in the winter time. Also it should be provided with a draw-off stop (not shown in cut) at the lowest point to prevent the accumulation of sediment. The pipe leading from the top connection on the water front to the top of the boiler is run along the ceiling and thence down to the top of the

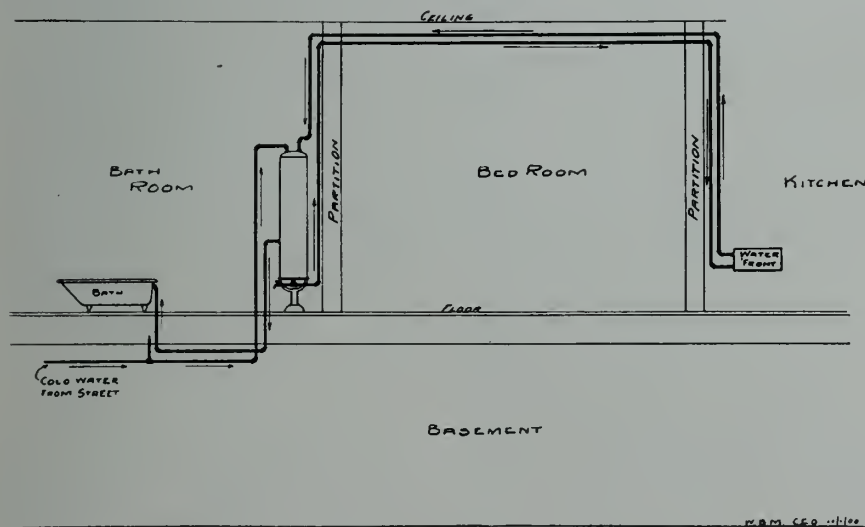


FIG 1.

same experience might be had, due to some faulty construction of the chimney.

Many otherwise good working stoves and furnaces have been found faulty in operation and proved unsatisfactory to

lessened, and insisting that each stove, range or furnace requires a separate chimney flue of ample size and proper construction. It will bring greater satisfaction to every user, dealer, and manufacturer.

boiler. This pipe should be provided with an air cock at its highest point (not shown in the illustration), or a relief pipe with valve that would be easy of access, so the accumulated air could be easily removed at intervals. Or if it is possible it would be still more preferable to bring this circulating pipe over to a point directly above the boiler, connecting the same into the side of a T and from the bottom of the T run on down to the connection with the top of the boiler. From the top of this T the connection would be made to the

bath tub or to any other point where hot water was desired. This arrangement would do away with the necessity of any air relief pipe or valve as the act of opening the top would prevent the accumulation of any air in the circulation pipes between the range or stove and the circulating boiler. It is to be recommended that the flow and return circulating pipes between the stove or range, and the boiler should be 1-inch pipes instead of $\frac{3}{4}$ -inch pipes as frequently found.

establishment at that place. L. G. Ells will manage the new business.

An effort is being made to form a company at Kingston to take up the question of heating buildings by steam from a central plant. The city council may also be asked to consider the matter. It has been reported that Sarnia and Berlin have piping laid in their streets for the purpose of supplying houses and stores with steam heating and the plan might also be followed here.

McClelland Brothers, Associated English Factories, Birmingham, Eng., have opened a branch sample room in Toronto. Among other firms represented is the Charles Joyner Co., Ltd., Birmingham, manufacturers of high-class gas and electric fixtures. The display shown in the Toronto office is very modern and is attracting considerable attention. The trade is invited to call at the sample rooms.

Early last spring the premises of the Amherst Foundry Co., Limited, Amherst, N.B., were destroyed by fire. Rebuilding was, however, started without delay, with the result that the output for 1907 was practically equal to that of 1906. The machinery in the shops is being worked by electricity, supplied by the Maritime Coal, Railway & Power Co., Chebucto. The company manufactures enamel, stoves, furnaces, etc., and the company is known as one of the largest in the Maritime Provinces.

E. B. Brittain, special traveling representative of the Pacific Hardware & Steel Company, San Francisco, returned home this week after a fortnight's visit with his brother, C. J. Brittain, manager of the Toronto branch of the Canadian Fairbanks Company. Mr. Brittain was formerly with the James Morrison Brass Mfg. Co., leaving Toronto about six years ago and joining the staff of the Robertson-Godson Co., Vancouver, but four years ago removed to San Francisco, to accept the position he now holds. The Pacific Hardware Company is understood to be the third largest jobbing concern in the United States.

Shaw & Mason, Limited, Sydney, N. S., have experienced considerable growth since the company was reorganized early last year. The company has recently moved into its new quarters and have added an iron foundry, brass and machine shops to the business, in which brass and iron castings, sheet metal roofing, tinware, enamelware, etc., are turned out. In addition the company are engaged as general hardware jobbers. Among the contracts recently completed by Shaw & Mason was a complete system of steam heating at the I.C.R. shops, Charlottetown, P.E.I.

CONGRATULATIONS.

Congratulations are in order to Jos. Laurier, vice-president of the National Association of Master Plumbers and Steamfitters, who is to be married on February 4 to Mlle. Bernadette Mignault, daughter of Dr. P. Z. Mignault, of St. Augustine, Quebec. Mr. Laurier is one of Montreal's prominent master plumbers and has always taken a deep interest in elevating the trade. His fellow craftsmen and many friends in the trade will wish him all joy, long life and happiness.

NEWS OF THE TRADE IN CANADA

Sarnia has decided to raise \$6,000 for the extension of the waterworks.

The firm of Adams & Mann, plumbers, Winnipeg, has been dissolved.

Humboldt, Sask., will spend \$10,000 for a proper system of fire protection.

Kingston has carried a by-law granting \$3,800 for building the Queen street sewer.

The by-law to grant \$8,500 for improvement to the Central school was carried at Kincardine.

An automatic fire sprinkler system is being installed in the "Surprise" soap factory at St. Stephen, N.B.

Hespeler ratepayers passed a by-law to raise \$12,000 for the extension of a pipe line for fire protection.

Mr. Scott, of Scott & Bennett, plumbers and steamfitters, Galt, was a visitor in Toronto during the week.

Mr. Leonard, manager of the Crane & Ordway Co., plumbing supplies, Winnipeg, was a visitor in Toronto during the past week.

Newman & Popham, plumbers, Toronto Junction, have assigned. The liabilities amount to \$1,000 and the assets to \$500.

Love & Holt, Toronto, who have conducted a plumbing shop for some years, have dissolved. Mr. Love will continue the business.

The Catholic church at Lachine will be re-built and enlarged to seat 4,000 people. The cost of the alterations will be \$80,000.

Peterboro has decided to assess water rates against all vacant property passed by water mains, whether owners are consumers or not.

E. R. C. Clarkson, as assignee of the estate of W. Mashinter & Co., plumbers, Toronto, is suing J. P. Holden for \$402.07, balance of account.

At Waterloo by-laws to extend the sewer farm, to install a sanitary system in the schools, and to enlarge the gas plant, were carried.

The first annual banquet of Galt's Plumbers' and Steamfitters' Union was held last week. A dinner and concert were enjoyed by all present.

Sherbrooke, Que., will have a waterworks system installed this year. The advisability of using wooden pipes in place of iron ones is being discussed.

The Central Heat, Light & Power Co., Montreal, are installing an extra 400 horse-power boiler, with a view of extending their steam and hot water system of heating stores and buildings.

Ald. N. J. Clarke, plumber, Hamilton, has been re-elected alderman for 1908. Last year he successfully conducted the affairs of the fire and water committee, to which he has again been appointed.

Building permits in Edmonton show an increase of about \$500,000 over 1906. For 1907 the figures supplied by the treasurer's department are \$2,280,210. The number of permits issued was 910, a decrease of 60 for the year.

W. J. Miller has been appointed manager of the Labatt Mfg. Co., Toronto, manufacturers of plumbers' supplies, in succession to D. W. Wilson, who recently succeeded Richard Crashley in that position.

James Morrison Brass Mfg. Co., Toronto, has received the contract for re-wiring the Parliament buildings, Toronto. Many handsome fixtures will be installed. The contract for the wiring amounts to \$10,000.

Lockhart & Co., plumbers, Galt, are busy these days. They have just completed a church contract near Sheffield, and are at present engaged on a large contract in Galt. Mr. Lockhart is an enterprising young citizen and his work gains for him increased patronage.

Wm. Linton, Ontario salesman for the Standard Ideal Co., Ltd, Port Hope, was elected to the municipal council of East Toronto, in the recent elections. He polled the second largest vote given to any candidate, and as he took no part in the campaign, considers the result as very complimentary to himself.

F. E. Bayer, head of the plumbing firm of Bayer & Co., Sydney, N.S., was recently waited on by his employees, and presented with a handsome Morris chair and a well-worded address. Mr. Bayer was unprepared for this handsome testimonial of the regard in which he is held by his employees, but he replied warmly, thanking the donors for their useful gift.

St. John, N.B., is not faring well in regards to water supply this winter. The main broke again on January 7th and the whole town was without a supply for one night. This is the second time the main has burst in two months.

W. Wylie Rockwell, Kentville, N. S., has opened a plumbing and steamfitting

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Jan. 21.—In common with the rest of the other trades, plumbing and heating is very dull. Jobbers are somewhat late in placing their orders with the manufacturers, and are apparently waiting to see how things will turn. Manufacturers, however, confident in the belief that there will be no great diminution in the demand when it does come, are working at average pressure. It is not a satisfactory position for them by any means, as the delay in the orders gives them a relatively lessened indication as to the gauging of their output. Rather than incur the chances of a shortage, they are being guided by the standard set in the same period last year.

For the time being plumbers are slack and there are unusual evidences of an unemployed market. The smaller firms are feeling the lack of money, and cannot undertake jobs which at other times they would do. Bids are not being met by the general contractor in the prompt way they used to be, and this presses heavily upon the smaller men. There should be renewed activity for the trade, however, when the situation eases off a little. Although many building propositions have been put aside for the time being, there are many half-finished structures on which work is to be resumed. This fact should tend to make the industry busier than is usually the case at the commencement of the year.

Iron Pipe—For the present moment stocks are fully equal to the demand—although this, of course, is no criterion of the extent of the holdings, as the call is now slight. We expect that the shortage which marked this industry last year will again make its appearance, presuming that the demand reaches the dimensions it did last year. Prices are unchanged.

Soil Pipe—Orders for spring delivery have not yet commenced to come in, and the market is very quiet. There has been a further drop in prices and we now quote lead pipe and waste at 20 per cent. This reduction may tend to stimulate the demand. Traps and bends remain unchanged.

Solder—This line is, of course, affected as the others by the slackness in trade, and the demand is stagnant. We quote half and half 19c, and wiping 18c.

Enamelware—Owing to cutting by American manufacturers who are trying very hard to get in on the market again, special ware bath tubs have been reduced \$1. This price, however, is only for immediate delivery.

Brass Goods—There will be very little buying until building commences. First-class work is still maintaining its price, and will continue to do so, as the copper market is stiffening. Much cheap stuff is being dumped upon the market here, and the prices ruling on some of the articles are very low. We quote standard compression work at 57½ to 60, and fuller work 65 per cent. off list.

Radiators and Boilers—The season is very slack, and manufacturers are now simply waiting for the orders to commence to come in. Quotations are 50 and 10 off list.

Cast Iron Fittings—The market is quiet, and there is nothing of interest to note. We quote 50 and 10 off list.

Metals—The market generally is improving, and prices are steady under better conditions all the way round. Ingot copper, 15c; ingot tin, \$32; lead, \$4.50; pig iron, \$21.50 for Middlesboro, No. 2, \$20.50, Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, Jan. 21.—Stock-taking in the local warehouses of the plumbers and steamfitters has been completed, and the results of 1907 are admitted satisfactory. During the year all reliable firms had as much business as they could attend to, and as a result the different companies are satisfied with trade. Since New Year's the journeymen plumbers and steam fitters have not had much to do, the dull season having been added to by the comparatively mild winter enjoyed so far. Contracts, however, are beginning to come in for spring building and the mechanics and jobbers will all be busy again in the course of a few weeks.

The travelers representing the different Toronto firms are again on the road, and though the business being done does not compare very favorably with the same period last year, the jobbers are satisfied with the results of the business coming in.

There is every prospect at present of a large amount of building being done in 1908, and when this starts a marked impetus will be given to trade.

During the month the jobbers are issuing new price lists to customers, but so far those issued have not shown any marked variance of prices, though the discounts on lead and brass products show a slight increase. There is little doubt that confidence in the future is gradually returning.

Iron Pipe—The demand is not so brisk at present, owing to the fact that few buildings are being raised, all of last year's contracts have been finished. The common plumbing sizes are still scarce but the manufacturers are rapidly making stock and present indications point to a well stocked market for the busy season. We still quote: 1-inch black at \$5.61, and galvanized at \$7.26.

Soil Pipe—The market situation of this commodity is unchanged, as most retailers laid in large stocks before the raise came. Prices are as follows:—Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent., and fittings, 60 per cent.

Lead Pipe—The discount in lead pipe and waste have advanced from 10 to 20 per cent. since last writing. Caulking lead is quoted at 5½ cents per pound. Traps and bends remain at from 50 to 60 per cent.

Solder—The market is stagnant, and prices are unchanged for wiping at 18c, with half and half quoted at 20c.

Cast Iron Fittings—The New Year's business in fittings so far has been fair, and at present the market is firm. Supplies are plentiful, quotations remaining

at from 50 to 50 and 10 per cent. off list price.

Radiators and Boilers—There is fair sorting business being done at present, which is greatly assisted by the demand for kitchen boilers, which has remained good all fall. Quotations remain at 50 and 50 and 10 off list.

Brass Goods—The demand for brass goods is not extensive at present and it is expected that prices will show a decrease owing to the copper situation. Owing to large stocks on hand the manufacturers have kept the prices up, but a drop cannot be far off at present. No changes marked the local market during the week.

Enamelware—There is little activity in this line to date and the prices remain steady. A drop of from \$1 to \$2 on bath tubs has gone into force since last writing. New price lists will be published during the week.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

FOR SALE.

PLUMBER'S Cabinet for sale, cost \$75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION WANTED.

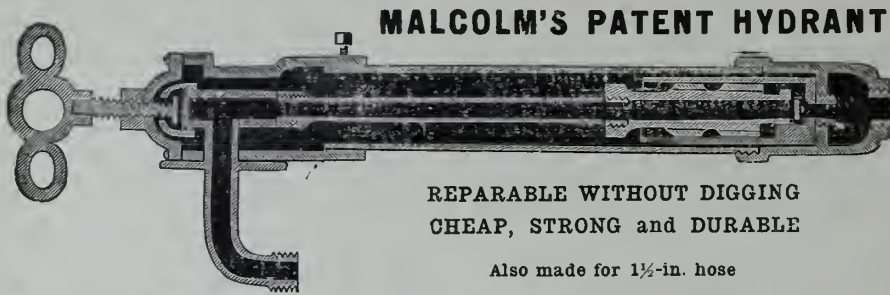
WANTED by practical plumber, steam and hot water fitter, of 16 years' experience, thoroughly conversant in both trades mentioned, position as manager or foreman; can handle work and men to advantage. Would like to communicate with firms requiring same. Box 23, PLUMBER AND STEAMFITTER, Montreal. (27)

SITUATIONS VACANT.

WANTED by practical plumber, steam and hot water fitter of 16 years' experience, thoroughly conversant in both trades mentioned, position as manager or foreman; can handle work and men to advantage. Would like to communicate with firms requiring same. Box 23, PLUMBER AND STEAMFITTER, Montreal. (27)

WANTED—A good tinner on furnace work, capable of doing plumbing work. Year round job to the right man. Address Box 436, North Bay, Ont. (17)

WANTED—A traveler for Canada, to represent a large Canadian manufacturer; must have acquaintance with wholesale and retail plumbing trade, retail hardware and gas companies; only those who can absolutely fill the requirements need apply. Give references, age, married or single, salary expected. Address Box 684, PLUMBER AND STEAMFITTER, Toronto. (4)

**MALCOLM'S PATENT HYDRANT**

REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

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MAIN 5101

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about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect ALL the items of information appearing in Canadian newspapers about any subject YOU are interested in. Our service is thorough. We don't miss an item. If you want ALL THE CURRENT INFORMATION about a pet subject, we can supply it at the lowest cost. By using our service you can KEEP POSTED on any subject.

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THE CANADIAN PRESS CLIPPING BUREAU,

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10 Front St. E., Toronto

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

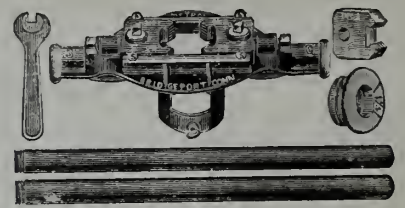
OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

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If your nearest dealer does not handle our goods, write us.

**The Armstrong Manufacturing Co.**

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Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

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Two Heads are Better Than One

You readily admit that, don't you? Then it shouldn't be difficult to convince you that the **CREAM** of a hundred magazines is better than the one or two periodicals you are now reading. Read what C. Edgar Wood, General Sales Manager Dominion Cartridge Company, of Montreal, has to say about Busy Man's Magazine:

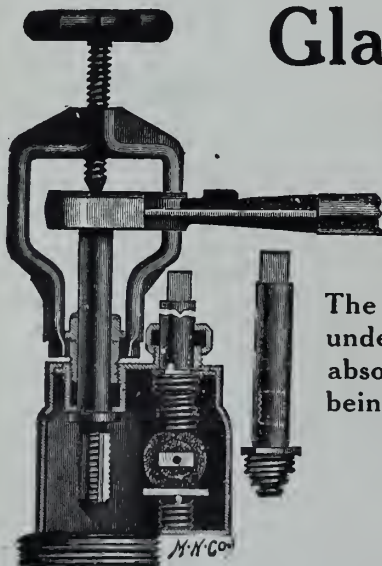
I cannot resist telling you how well I like the Busy Man's Magazine. It is the only publication that I keep a file of; in fact I have to because practically every article in the various issues has been blue pencilled by me for future reference.

I have never found under one cover so much that will interest a business man. You have certainly succeeded in obtaining all the articles of value from the principal magazines of the world, and as a consequence I have not only been able to save a great deal of time by reading your magazine, but also a good deal of money. For instance, I had subscribed for 32 different publications. I now find that Busy Man's Magazine covers the gist of the majority of them.

This is exactly what the Busy Man's will do for you. Save you money—save you time, by giving you the most timely, interesting and instructive articles appearing in the world's magazines and periodicals.

Try it. Send a card for a free sample copy. Write us to-day.

THE
BUSY MAN'S MAGAZINE
TORONTO

**Glauber Tapping Machines**

FOR ANY KIND OR MAKE
OF CORPORATION COCK.

The only machines that do the work under the heaviest pressure and are absolutely proof against accident while being operated.

SENT ON 30 DAYS TRIAL.

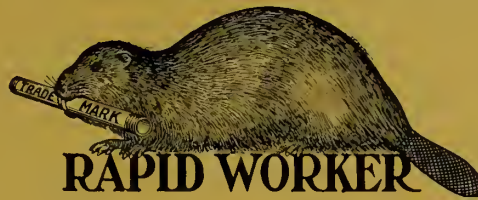
Guaranteed 5 years.

GLAUBER BRASS MFG. CO.,
CLEVELAND, OHIO, U.S.A.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.



Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto



Really Satisfactory Radiators

are the only kind worth handling. The dealer who handles the other kind is laying himself open for a heap of trouble. If you want a radiator which is easy to instal, elegant in appearance and entirely satisfactory in operation, write and ask us about

"SOVEREIGN" RADIATORS

They have a larger connection at the feed-pipe than other radiators, and have also more heating surface to the loop. They have been endorsed by hundreds of dealers as a most profitable line.

TAYLOR-FORBES CO., Limited

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ST JOHN, N.B.—H. G. Rogers, 53 1-2 Dock St.

MONTREAL—122 Craig Street West

QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited.

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Standard Ideal Cast Iron Porcelain Enameled Ware



is so constructed as to meet the requirements of the Canadian Trade. Dealers in plumbing equipment will find this Ware a splendid business getter. Standard Ideal Porcelain Enameled Ware ensures perfect sanitation and satisfies critical householders.

We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances.

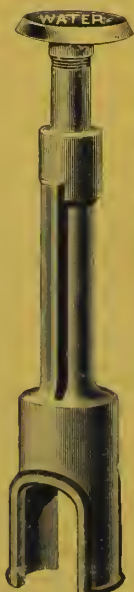
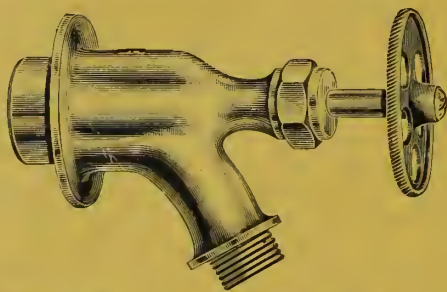
THE STANDARD IDEAL COMPANY LIMITED

Head Offices and Factories,

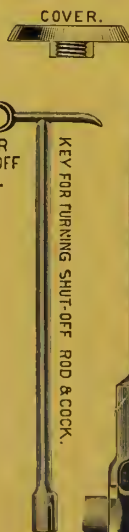
PORT HOPE, Ont.

Sales Offices and Sample Rooms : TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 156 Lombard St.

(517)



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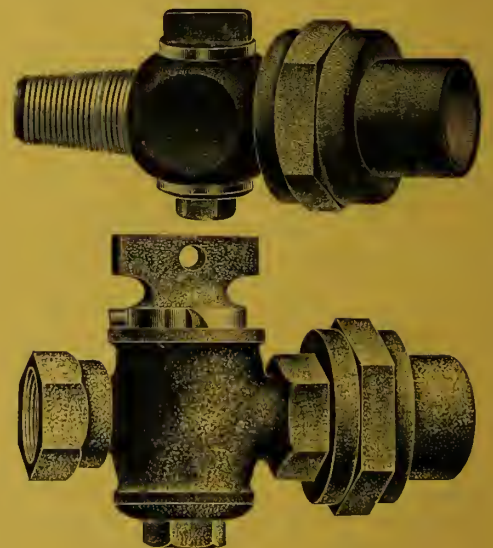


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SECTIONAL VIEW OF GAS & WATER
EXTENSION SERVICE BOX.

Fittings
That
Don't
Disappoint



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Complete Works: . . . ERIE, PA., U.S.A.

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THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St.

TORONTO, 10 Front St. E.

WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 3. (New Series).

Publication Office : 10 Front St. East, TORONTO, FEB. 12, 1908.

Old Series, Vol. XX. No. 3

Laundry Tubs

PORCELAIN TUBS



PLATE 542 E.

are an indispensable fixture in the modern home. Made in three classes of material,—Cement, Enameled Iron and Porcelain—to fit the pocket book of the man of moderate means, as well as the builder of a palace.

ENAMELED TUBS

The tubs illustrated, are of No. 1 quality in pattern, style and finish. We might add that the Porcelain Tubs can be had of "Cane Finish," reducing the cost, while not diminishing the service.



PLATE 555 E.

SOMERVILLE LIMITED

59 RICHMOND STREET EAST, - TORONTO

Robertson's Marble Lavatories



Plate E 90. List Price \$70.00.

We manufacture and carry in stock a full line of Plumbers' and Steamfitters' Supplies. Send us your enquiries.

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SCIENTIFICALLY PERFECT.



PLATE 511 E.
NOISELESS IN OPERATION.

Ontario Closet

Somerville's **ONTARIO** Closets are **Syphon Jet Closets**. A part of the water in tank is diverted through a separate channel in bowl, discharging in the form of a jet into the trap seal. **Result**—the bowl is emptied and flushed twice thoroughly, then re-filled with water, ensuring a seal against sewer gases, etc., of from 5½ to 6 inches.

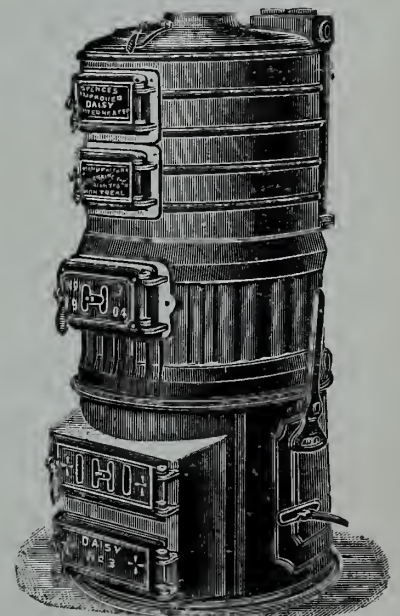
SOLE OWNERS:

SOMERVILLE LIMITED

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HONEST RATINGS

The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.



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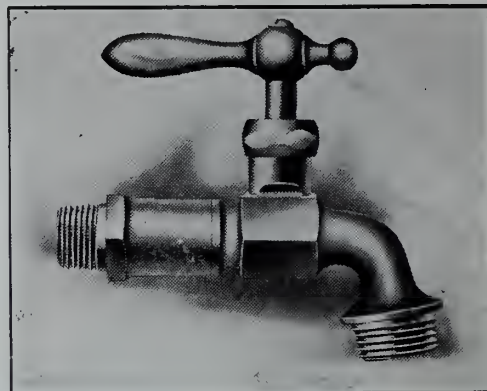
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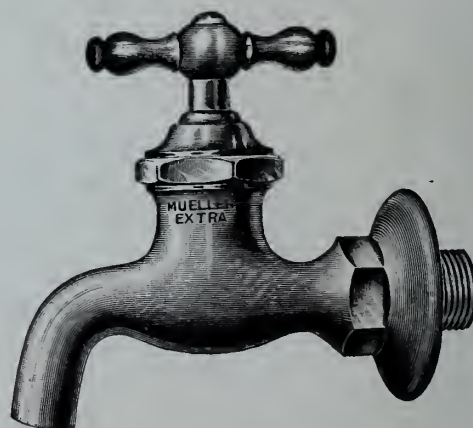
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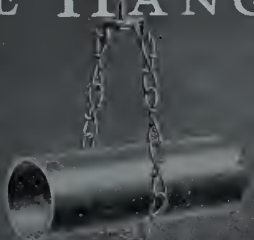
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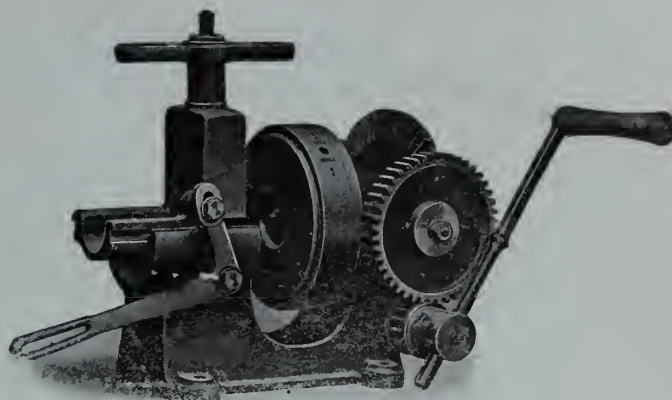
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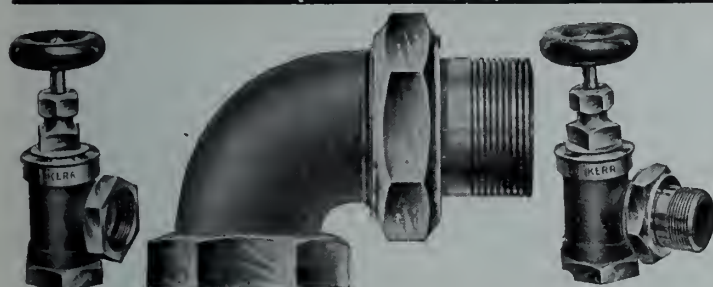
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Determining Amount of Radiating Surfaces

Simplified Methods of Estimating Hot Water Radiation—An Easily Understood Explanation Illustrated by Charts—Written for this paper by C. E. Oldacre, Toronto, and continued from our last issue.

Another method of calculating the heating surface required is to determine the total heat loss in heat units (B.T.U.) and divide this by the heat units given off by one square foot of heating surface. This gives the number of square feet of heating surface that will be required. The results will differ but little from the foregoing, and where there are any slight differences it is due to dropping of small fractions in the multipliers or factors for practical purposes.

According to this method the radiation for a northwest room, two sides exposed, one-fifth glass surface, size 20 ft. x 20 ft. x 10 ft., or 4,000 cubic feet, with two changes of air per hour, would be calculated in the following manner. As before the conditions are zero outside, 70 degrees inside, water 180 degrees Fahrenheit and the units of heat given off per square foot 176 B.T.U.

Wall surface 320x.25x70 equals	5,600
Glass surface 80x1x70 equals	5,600
Cubic contents (4,000 divided by 25)x70 equals	11,200

Total heat loss 22,400
Radiation required equals 22,400 divided by 176 equals 127 plus or 128 square feet as the amount of radiation required under the conditions as specified.

The above is based on a loss of .25 heat unit from ordinary wall, and 1 heat unit from glass, per square foot, per hour, per degree of difference between inside and outside temperature.

The report of the committee to secure data on hot water heating presented at the fourteenth annual meeting of the American Society of Heating and Ventilating Engineers, held in New York Jan. 21-23, 1908, gave the following concerning the calculation of direct radiation for hot water heating:

TABLE A.

From Committee Report American Society Heating and Vent. Engineers. 1908.

Within the ordinary range of temperature, the losses in B.T.U. per sq. ft. per hour through various substances as given below seem to be conservative.

	40	30	20	10	0	-10	-20
Temperature outside.....	70	70	70	70	70	70	70
Temperature inside.....							
8 inch brick wall.....	13	18	22	27	31	36	40
12 inch brick wall.....	10	13	16	20	23	26	30
16 inch brick wall.....	8	10	13	16	19	22	24
20 inch brick wall.....	7	9	11	14	16	18	20
24 inch brick wall.....	6	8	10	12	14	16	18
Single windows.....	36	49	60	73	85	93	105
Double windows.....	24	32	40	48	56	62	70
Single skylight.....	31	42	52	63	73	84	94
8 inch frame house, well plastered inside	8	10	13	16	19	22	24
Cold ceilings or floor areas.....	5	6	8	10	11	13	15

"The best practice calls for the use of the heat unit as a basis for computing the amount of radiation required.

The heat lost through surfaces exposed to cold may be found by using the

above multipliers. The result should be increased by 30 per cent. as an allowance for leakage; or in rooms with three or four sides exposed, the leakage may be assumed as ordinarily not exceeding one change of air per hour, and the B.T.U. lost in this way may be determined as follows:

$$\frac{C \times T}{55} \text{ equals B.T.U.}$$

C equals contents of room; T equals temperature desired. Fifty-five is approximately the number of cubic feet of air raised one degree by one B.T.U.

The glass area should be deducted from the exposed wall area before multiplying. The table is for southern exposure. Additions should further be made as follows: North, 30 per cent.; east, 10 per cent.; west, 20 per cent. This addition is for the increased transmission of heat due to wind, and must be used with judgment and consideration for the locality of the building.

The total B.T.U., as obtained above, after additions for leakage and exposure have been made, is to be divided by 150 for hot water heating, as this is a conservative estimate of the amount of heat given off per hour by one square foot of ordinary cast iron radiation with the room at 70 degrees and the water at an average temperature of 170 degrees. The quotient is the amount of direct radiation needed."

A Practical Illustration.

The above method of calculating the heat losses and determining the amount of hot water heating surface that would be required to properly heat a room may be illustrated by using the room of

Glass exposure equals one-fifth total outside wall exposure.

Example:

	B.T.U.
320x19 equals.....	6,080
80x85	6,800

Loss in B.T.U. from wall & glass	12,880
Add 30 per cent. for leakage.....	3,864
Add 30 per cent. of 6,440 (½ of 12,880) for north exposure....	1,932
Add 25 per cent. of 6,440 (½ of 12,880) for west exposure....	1,610

Total heat loss in B.T.U.... 20,286

20,286, divided by 150 equals 135 or 135 square feet of hot water heating surface in standard height radiation to maintain 70 degrees Fahr., in a room of 4,000 cubic feet contents (20 ft. x 20 ft. x 10 ft.) having a north and west exposure, one-fifth of the total exposure being glass and the outside temperature zero.

Comparison With Charts.

It might be of interest to here compare the results obtained by this method of determining the proper amount of heating surface and the results that are to be obtained by using the charts.

If we refer to Chart 1, showing the amount of radiation required for corner rooms with north and west exposure when the glass is one-fifth of the total exposure and the temperature outside is zero and 70 degrees Fahr. is to be maintained, we will note that the vertical line for 4,000 indicated by the figure 4 intersects the curve for 70 degrees between the horizontal lines marked 30 and 31. Then if we divide 4,000 by 30 we have as the result 133 1-3, or practically 133 square feet of hot water heating surface in standard height radiation or a difference, in this case, of only two feet between the two methods of determining the required radiating surface.

Through the use of the foregoing table of heat losses, the heat loss and the necessary radiation can be readily determined for any specific case when all the surrounding conditions are accurately taken into consideration.

Hot Water and Steam Divisors.

In determining the heating surface after obtaining the total heat losses the divisor for hot water is 150 and for steam is 250, so that dividing the total heat losses by these numbers gives the required amount of surface for hot water and for steam respectively.

If the surface has been determined for hot water then if this is divided by 5 and multiplied by 3 will give the necessary steam surface under similar conditions, or if the steam surface has been determined, then dividing the amount by 3 and multiplying by 5 will give the required hot water surface. This is for constant heating as is usually had where hot water is the heating medium and if

the heating is intermittent then the necessary additions will have to be made as has been noted according to the length of period of non-heating.

Prof. Kinealy's Tables.

Prof. J. H. Kinealy, in "Formulae and Tables for Heating," has given much valuable information regarding the determining of heat losses. It gives in English units the result of the investigation of the best German engineers into the heat losses of building. As he says "the amount of work that has been done in the way of gathering data and formulating rules for designing, is something surprising. And all of it has been done, in that thorough, painstaking way that characterizes most of the work done by German scientists." The work of the Germans is really a continuation of the investigations of Peclet in France whose work has been made familiar to English speaking engineers through

and interruption of heating. The increases recommended are 25 per cent. for surfaces having a northern, north-eastern or northwestern exposure; 20 to 30 per cent. for surfaces exposed to winds; 10 per cent. of the total heat losses for rooms more than 13 feet from floor to ceiling; 20 per cent. of the total heat losses for rooms in which the heating is interrupted daily.

German engineers base their calculations upon 4 below zero, Fahr., or 20 below zero, Centigrade.

The loss due to leakage has not been considered here and any calculation should be increased according to the leakage, whether it is sufficient to effect a change of the air once, twice, or more times per hour. The method of making such additions has been previously explained under "heat losses."

Prof. Carpenter's Rule.

Prof. R. C. Carpenter in ("Heating

the sum of the numbers by .4. The factors for steam with 10 above and 10 below zero are .22 and .262 respectively. The factors for hot water with 10 above and 10 below zero are .34 and .45 respectively.

"The amount of radiating surface as given should be increased respectively as follows:

Ten per cent. where the exposure is a northerly one and winds are to be counted on as important factors.

Ten per cent. when the building is heated during the daytime only and the location is not an exposed one.

Thirty per cent. when the building is heated during the daytime only and the location of the building is exposed.

Fifty per cent. when the building is heated during the winter months intermittently, with long intervals (say days or weeks) of non-heating.

"Certain allowances in addition to the above, the amount of which must be determined by the judgment or experience of the engineer, should be made for unusual construction of the buildings, either good or bad."

Prof. Allen's Rule.

Prof. John R. Allen in "Notes on Heating and Ventilation" gives the following rules for proportioning the radiation for steam heating:

Rule I. Divide the volume of the room by 55. Add one-fourth of the exposed wall surface; add the glass surface and multiply the sum of these three quantities by .275. The product will be the direct radiation in square feet.

Rule II. (A) For ordinary rooms. Divide the exterior wall surface by 4, add the glass surface and multiply the sum by .4. (B) For entrance halls. Divide the exterior wall surface by 4, add the glass surface and multiply the quotient by .54. (C) For the wall surface in basement, rooms below the ground line. Divide the wall surface by 4, and multiply the result by .17. (D) For floors having unheated space below. Divide the floor space by 4 and multiply the result by .23.

Rule III. Divide the volume of the room in cubic feet by the factors given below and the quotient will be the radiating surface in square feet.

First floor rooms, one side exposed 55
First floor rooms, two sides exposed 50
First floor rooms three sides exposed 45
Sleeping rooms, second floor, 60 to 70
Halls and bathrooms..... 50
Offices..... 50 to 75
Factories and stores..... 75 to 150
Assembly halls and churches 75 to 150

Baldwin's Rule.

Rule IV. Divide the difference between the temperature at which the room is to be kept and that of the coldest outside temperature by the difference between the temperature of the steam in the radiator and that at which you wish to keep the room and the quotient will be the square feet of radiating surface to be allowed for each square foot of equivalent glass surface. By equivalent glass surface is meant the wall surface divided by 4, plus the glass surface.

In all these rules the factors to be allowed for exposure should be applied. Where the rule does not involve the contents of the room it will be necessary

(Continued on page 7).

Kinealy's Table XI. Values adopted by the State of Prussia, Germany.

(A) Brick Work:

Inches thick.		Inches thick.	
4.72	0.492	30.3	0.164
9.85	0.348	35.4	0.133
15.00	0.266	40.5	0.123
20.1	0.226	45.6	0.113
25.2	0.184		

(B) Sandstone Masonry, Block or Rubble.

Inches thick.		Inches thick.	
11.8	0.451	31.5	0.266
15.7	0.390	35.4	0.246
19.7	0.348	39.4	0.226
23.8	0.318	43.3	0.205
27.6	0.287	47.2	0.195

The values for limestone masonry should be taken as about 10 per cent. greater than for sandstone masonry of the same thickness.

(C)

Single window.....	1.03
Double window.....	0.472
Single skylight.....	1.09
Double skylight.....	0.492
Doors.....	0.410

Kinealy's Table XIII.

(A) Ordinary furred brick walls:

Thickness of wall.		Thickness of wall.	
$\frac{1}{2}$ brick.....	0.28	2 bricks.....	0.18
1 brick	0.23	2 $\frac{1}{2}$ bricks	0.16
1 $\frac{1}{2}$ bricks	0.20		

(B) Partitions:

Ordinary stud partition with lath and plaster one side.....	0.60
Ordinary stud partition with lath and plaster two sides.....	0.34

(C) Ceilings and Floors:

Ordinary lath and plaster ceiling separating unheated space from heated rooms.....	0.62
Floor, single thickness, $\frac{3}{4}$ inch, warm air above and cold space below:	
(a) No plaster beneath joists.....	0.45
(b) Lath and plaster beneath joists.....	0.26
Floor, double thickness, $\frac{3}{4}$ inch, warm room above and cold space below:	
(a) No plaster beneath joists.....	0.31
(b) Lath and plaster beneath joists.....	0.18

Box's "Treatise on Heat" which is largely a translation of Peclet's "Traite de la Chaleur."

He gives the accompanying tables, showing heat losses through various materials per degree of difference between inside and outside temperature per hour per square foot of surface in B.T.U.

In connection with the tables cellars and closed rooms not heated are taken at 32 degrees and rooms often in communication with the outside air, such as passages, entrance halls, vestibules, etc., at 23 degrees Fahr. and various increases are to be made for exposures

and Ventilating Buildings"—1896, Page 205) gives the following rule for proportioning the radiating surface: Multiply the area of the glass, plus $\frac{1}{4}$ the wall surface, plus 1-55 of the cubic feet of air supplied per hour, by factors which are approximately as follows: If we are to heat to 70 degrees in zero weather with steam of (not to exceed) 10 pounds pressure, multiply by $\frac{1}{4}$ (.25); if we are to heat to 60 degrees, multiply by 1-5 (.20); if we are to heat to 50 degrees, multiply by 1-6 (.166). As the steam pressures increase, these factors are reduced. For hot water heating multiply

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BUYERS TAKE CHANCES.

A Toronto departmental store is making a slash in the prices of certain lines of ranges and furnaces, the quotations appearing to be below regular wholesale prices. No doubt there will be a rush to get the cheap heating goods, but what position will the customer be in a year or two hence when he wants to get some repair parts to patch up the bargain range or furnace?

What other reason can a foundryman have to let a price demoralizer get a stock of goods at less than trade prices other than to unload the manufactured stock of lines which he intends to drop and the patterns for which are to go on the scrap heap?

The incident illustrates the shortsightedness of anyone buying heating or plumbing goods at the departmental bargain sales. What is a bargain to-day is likely to go on the junk heap tomorrow, because as a rule there is no

guarantee behind the goods in the form of a manufacturer with a reputation to maintain.

Another instance to quote is the case of a Toronto man who a month or so ago bought an inverted gas lighting fixture at a bargain from a small dealer who had imported a limited quantity. Last week the mantle broke and a search of the city failed to locate a mantle to fit the fixture. It was a case of another bargain that went wrong.

The same result is likely to follow the purchase of a \$14.95 low down closet (regular supply house price \$15) from the departmental store price cutter. While the fixture may have every appearance of being of far higher quality than the regular supply house article, the lack of any manufacturer's name as a guarantee should be sufficient to cause buyers to fight shy of the "bargain" and certainly no master plumber who desires to build up a reputation for good work will take chances by installing fixtures that are not backed by the guarantee of reputable manufacturers and wholesalers.

Bargains are often boomerangs.

WHAT MARGIN OF PROFIT?

The letter by "Subscriber" on the correspondence page of this issue continues the discussion begun in The Plumber and Steamfitter of Jan. 22, and gives some strong arguments in favor of more intelligent figuring of profits on the part of master plumbers and steamfitters.

The letter should be read by all in the trade and the subject further discussed in coming issues. Space will be given on the correspondence page to any plumber or fitter who has anything to say on any matter of interest to the trade.

WESTERN POSTAL SERVICE.

Complaints of inadequate and inefficient postal service in western Canada are more numerous than ever, and, apparently, the Post Office Department does not yet realize the gravity of the situation. These complaints are loudest perhaps from the newer districts, but even in the older towns, along the main line of the C.P.R., there are constant complaints, and a little investigation or a little actual experience, will show that these complaints are well founded. The department at Ottawa is so far removed from the scene of the trouble that the officials do not understand the situation, and they fail to realize that special attention is required to ensure an adequate service in the newer Canada that is so rapidly springing up west of the Great Lakes.

Western business men say that there will be no permanent relief until an-

other deputy minister is appointed, who will be given a free hand in the opening of new offices in the new towns and in making radical and sweeping changes in the method of handling the mails in some districts. There is no sympathy in the west with a policy which piles up a surplus each year, while the service is becoming more unsatisfactory every day. The slow workings of a red tape official system compel new towns to wait weeks and months before new post offices are opened, and the meagre salaries paid the postmasters are responsible for the fact that the service is miserably inefficient in all parts of the west. Officials cannot be expected to do more than they are paid for.

ESSENTIALS OF SUCCESSFUL SALESMANSHIP.

The foundation stones on which salesmanship rests are intelligence, integrity and the knowledge of goods which you are showing, and any of those three qualities can be developed, writes G. F. Ellsworth. I have always thought that the man who went after his customer with some kind of system was far more successful than he who struck him haphazard. The good salesman, in my mind, is not only a good talker, but a good listener. It is necessary that you, when selling an article to your customer, should know as well when to stop talking as when to talk. You know there is nothing that flatters a man more than to induce him to talk. The personal pronoun "I" is agreeable to you, but not to the other fellow. If you can get your customer to asking questions about the articles you are attempting to sell him, you have put him on the defensive and you have that double advantage over him. Whenever I have a customer come into my store to purchase an article, it is obvious that he or she intended to when they came in, and I did not succeed in selling them, I analyzed the entire conversation. The fault was mine; I was willing to admit it. You have got to admit it yourself; it is your own fault if you do not make a sale. I went all over the talk and endeavored to find out where the weak spot in my argument was, and if I found it I corrected it. We kept prospects of every prospective sale. We had cards with a space for the name, address of party, the article that they came in to see, the price we quoted them, and any other information. This was in the event of their not buying. These cards were all properly made out and placed upon my desk, and in about a day or two I usually wrote the party.

SIZES OF SOIL PIPE.

The advanced position held by the American sanitary system is not yet all that is desired by those who are most interested in its installation and design. This is evident from the criticism it has received for the last few years. Controversy has been held between those who favor material changes and those who favor holding to the best practice now followed. The Sanitary Committee of the National Association of Master Plumbers of America has employed experts to conduct experiments to learn the facts in reference to some parts of house plumbing. A younger society organized to give attention to the scientific phases of the house drainage system while laboring for its permanent existence is arranging to make tests to get authoritative information. In three different widely separated cities, for example, dwelling houses have been equipped with a drainage system in which 3-inch soil pipe is in use. A general use of 3-inch soil pipe is advocated by some conscientious men in view of the fact that few water closets, particularly some of the most satisfactory types, have a full 3-inch waterway through them. Other equally conscientious sanitarians urge the avoidance of unnecessary expense as caused by the use of larger piping than that which they claim would serve equally well. These phases of the question as applied to the dwelling-house drainage system have been so persistently presented to our notice that they are now brought to the attention of our readers, and to enable their better consideration some points are presented that they may be covered in a discussion which we hope will be given the subject in view of its importance.

What has been the behavior of 3-inch soil pipe under your observance?

When 3-inch soil pipe was used in the past, did it clog and was there any sound objection to its use discovered?

Is the accelerated movement in a 3-inch vertical pipe sufficient to insure a proper discharge of fixtures?

Could the horizontal drain pipe also be reduced to 3-inch?

What is the average size of the waterway through earthenware closets of the best type?

Is the 4-inch soil pipe necessary for dwelling house use in connection with the water closet generally provided?

Would the sanitary efficiency remain unimpaired with the use of smaller pipe?

On what basis or calculation do you understand the size of soil pipe to be determined?

Would the family and the plumbing trade both benefit through the more extended use of sanitary equipment if it could be provided at a lower cost?

With full sanitary protection is lowering the expense for equipment an end worthy of being sought?

The views of practical men are invited to the discussion of these questions, and the necessary space for their presentation will be gladly afforded. Certainly there are many men who have given thought to the subject and who have critically watched what has transpired in the vertical and horizontal pipes of the house drainage system so



NAP. TURCOT,

Elected Mayor of Ville St. Louis, a Suburb of Montreal, for 1908.

that they know what the effect of a reduction in diameter would eventually be. There will doubtless be a difference of opinion and surely their expression will either strengthen the adherence to the present day practice or show where improvement can be made.

The subject is being discussed in the Metal Worker and Canadian plumbers can to advantage take up the matter in the columns of The Plumber and Steamfitter. Let us have a few short letters on this subject for publication in our next issue.

Nap. Turcot, last year's president of the Master Plumbers' Association of Montreal, has been elected Mayor of Ville St. Louis. Mr. Turcot defeated former Mayor Gelinat, who was running for another term.

DETERMINING AMOUNT OF RADIATING SURFACES.

(Continued from page 5).

in very large rooms or in rooms where the wall surface is very small in proportion to the contents of the room, to add a certain proportion of radiation, usually not more than 10 per cent., to allow for heating the air in the room quickly when it has been allowed to cool."

Rules I., II., and III. are for 70 degrees Fahr., with zero outside. Rule IV. does not allow for the various changes of air or exposures within itself and such allowances should be made as noted above.

The above rules are applicable to hot water by dividing the result by 3 and multiplying by 5. For ordinary rooms an extra allowance of 10 per cent. should be made to account for intermittent heating of ordinary (those not operating on a vacuum or vapor system) low pressure steam.

Mills' Rule for Steam.

J. H. Mill's rule for steam is the Two, Twenty, Two Hundred rule that has been used by many. It is as follows:

Divide the glass by 2
Divide the wall by 20
Divide the cubic contents by 200

These added together will give the quantity of steam radiation. Add 60 per cent. for hot water heating. No allowance here has been made for exposure or varying changes of air.

The Holland Radiator Co., Chicago, Ill., U.S.A., in their Heating Manual, give the following rule, which is a very conservative and comprehensive one, which provides for any range of temperature:

"Ascertain the net glass, net outside wall and cubic contents of the room. To the glass add $\frac{1}{2}$ the wall and to this the cubic contents divided by 50 (if one change of air). Multiply this total by the number of degrees the temperature is to be raised. For steam radiation, divide this product by 255 and for water by 155.

In estimating it is good practice to allow two changes of air in first floor living rooms, halls and corridors. For northern and western exposure add 10 to 15 per cent.; eastern, 5 to 10 per cent., depending upon their glass surface. Add 50 per cent. for indirect; 25 per cent. for direct-indirect."

In the application and use of any formula or rule the heat losses from the glass, wall and changes of air need be carefully taken into consideration, as also the nature of the exposure and whether the heating is constant or intermittent, giving due consideration to variations in size and construction of buildings, and the outside and inside temperatures, and the temperatures of heating surfaces and the disposition to be made of the heating surfaces.

The new molding shop of the Gartshore-Thompson Pipe Foundry, Hamilton, has just been completed. This molding shop is designed to do jobbing work and small repetition work for their pipe foundry. The management are considering the installation of molding machines.

Heating of Jenkins Bros. New Factory

Details of the Vacuum System Installed in the New Jenkins Bros. Brass Plant at Montreal—Steamfitting Being Done By James Ballantyne of That City.

An elaborate system of heating has been installed in the new brass factory of Jenkins Bros., at Montreal. The vacuum principle is employed, and as can be seen from the cuts we give, no effort has been spared to make the apparatus effective, and of the utmost utility. From the dimensions of the factory a good idea can be gained of the extent of the work, and the amount of steamfitting required. The main building and offices are about 203 feet by 54 feet; there is a storage room 36 feet by 63 feet 6 inches, a brass foundry 107 feet 5 inches by 63 feet 6 inches, a small pattern vault, and an engine and boiler house, 54 feet 10 inches by 38 feet 8 inches. From the isometric drawing of the plant the structural shape of the building can be understood.

The heating main is run overhead straight from the T in the exhaust pipe through the power house wall and across to the foundry building, as shown in Fig. 2. Over the passage it is suspended from wire cables stretched between the two buildings, a distance of 20 feet. Inside of the foundry building the main is hung from the floor, and the floor girders. It is run through the foundry and casting storage buildings, and the basement of the main building, as shown in Fig. 3. The size of the main and its branches is shown on the plans.

The manner of running the steam and return risers is shown in the sectional drawings, Figs. 4 and 5. They are fastened to the wall. The steam risers are

drained into the return system by means of drip loops, as shown in Fig. 4.

The returns are run as shown in the drawings and are equipped with differential valves at the points indicated on the drawings, a globe valve and dirt strainer being placed in front of each differential valve.

The returns from the coils in the basement of the main building are kept separate from the rest of the system, and

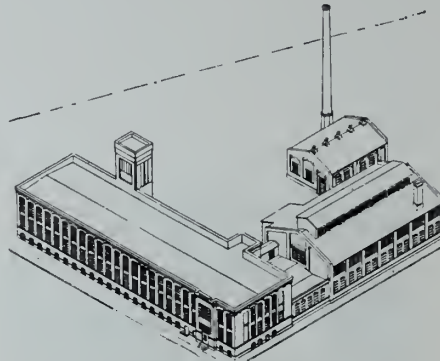


Fig. 1—Isometric Drawing of Plant.

all run on the walls under the coils, as shown in Figs. 3 and 4. They enter the main return pipe from above and through a check valve. Where the returns are carried below their proper grade, as in passing under a door, a pipe one size smaller than the return at that point

is also carried over the door, as shown in Fig. 4.

The returns from main building, except the basement, are run near and about one foot below the steam mains. The returns from the casting storage building and from the foundry building are run on the wall above the top of the foundations. The main return pipe is run from the basement of the main building to the power house, underground. It is inclosed in a box 6 inches square inside, made of 2-inch plank. This box is laid just below the bottom of the concrete floor in the casting storage building and continued at the same depth across the foundry building. Outside of the buildings the top of the box is two feet below the surface of the ground. The return terminates in a suction T located in a pit adjoining the power house. The manner of making this T is shown in Fig. 5.

The pipes, including mains, returns and heating coils, have a uniform slope in the direction of flow of quarter-inch in ten feet.

The vacuum pump is located in the engine room, and is piped to the suction T on the main return pipe, delivering the drips into the delivery tank, and through it into the feed-water heater. A plan and section of the vacuum pump and feed-water heater is shown in Fig. 6.

A 6-inch by 6-inch by 6-inch T and 6-inch gate valve, are placed in the steam main just inside the power house wall, to provide for the use of live steam, which is supplied through a reducing valve. T's $2\frac{1}{2}$ inches by $2\frac{1}{2}$ inches by $2\frac{1}{2}$ inches, and 3 inches by 3 inches by 3 inches, and gatevalves $2\frac{1}{2}$ inches and 3 inches, respectively, are placed in the branch steam mains in the basement of the main building, which

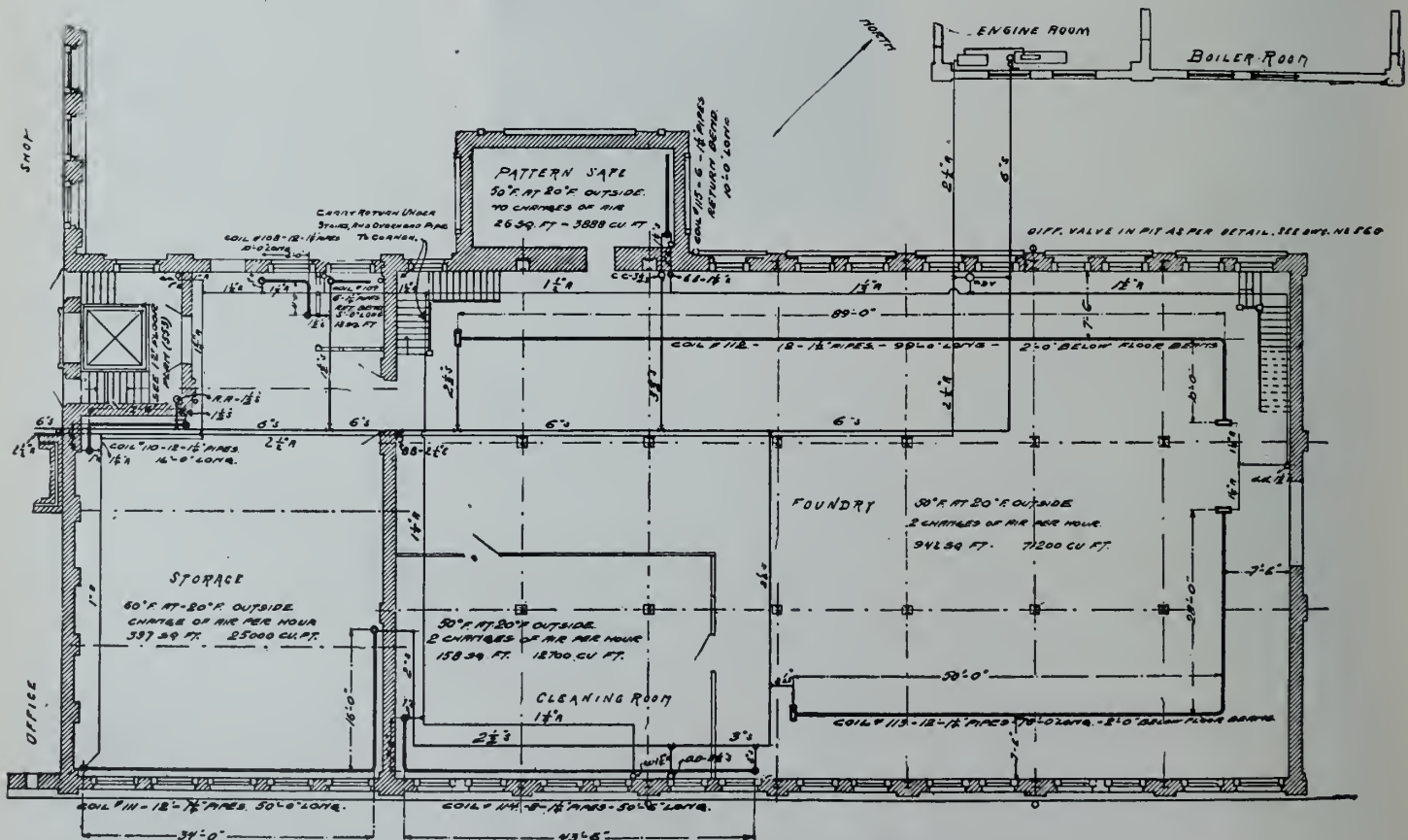


Fig. 2—First floor of Brass Foundry, Showing Piping Connections to Power House.

supply the office and draughting room radiators to provide for heating these radiators with live steam when the factory is not running. These tees and valves are indicated in Fig. 3.

The heating coils are constructed of 1½-inch wrought iron pipe. Manifold, or

offer in the saving of labor, and in the capacity and quality of the work done. In operation these tools differ from all others in that the dies cut down to the full depth of the thread, when the first thread is cut. The dies gradually expand until, when the thread is finished,

short thread may be cut without special adjustment.

Second—For vent piping where a long thread is not necessary a short thread may be quickly cut without special adjustment.

Third—Where fittings are running in-

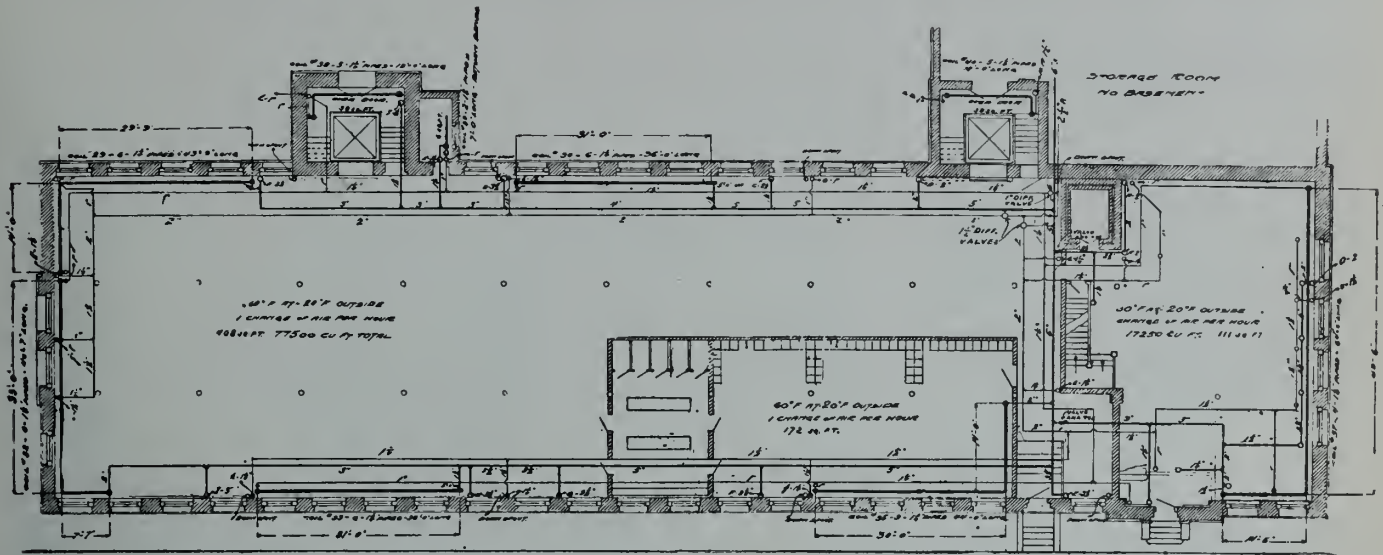


Fig. 3—Basement of Main Building.

branch tees, are used, except where return bend coils are indicated. The wall coils are mounted on hook plates. The top of the coils are one inch below the line of the window sills, except in the basement of the main building, where the bottom of the coils are 18 inches from the floor. Overhead coils are hung in a horizontal plane, on pipe-hanger rolls, so as not to interfere with workmen on the floor.

A dirt pocket, made as shown in Fig. 8, is placed on the drip connection of each coil, but not on the radiators.

The vacuum system installed is known as the positive differential system of steam circulation, Dominion radiators being used. The drawings and specifications were prepared by Barton & Carpenter, consulting engineers, 90 West street, New York, and The Plumber and Steamfitter is indebted to the Engineering Review, New York, for the illustrations, etc, for this article.

PIPE THREADING TOOLS.

The Toledo and Jardine pipe threading tools have become very popular with the trade within the short space of time, comparatively speaking, that they have been upon the market. This is not surprising, considering the advantages they

it presents an accurately tapering surface, to the outside diameter of the pipe. The advantages derived are the following:

regular in size, a thread of ordinary length will accommodate practically all variations in size, and allow a tight joint somewhere on its length.

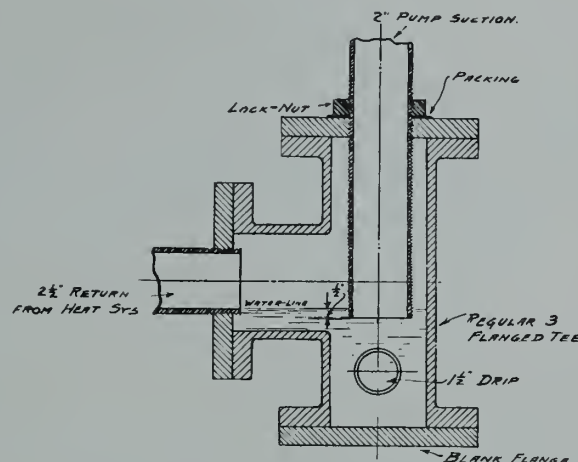


Fig. 5—Detail of Suction Tin Pump Pit.

First—For making up fine brass work, where it is desired to have all the threads covered by the fitting, a very

Fourth—For ammonia joints, a long, accurately tapered thread insures absolutely air, gas, or water-tight work.

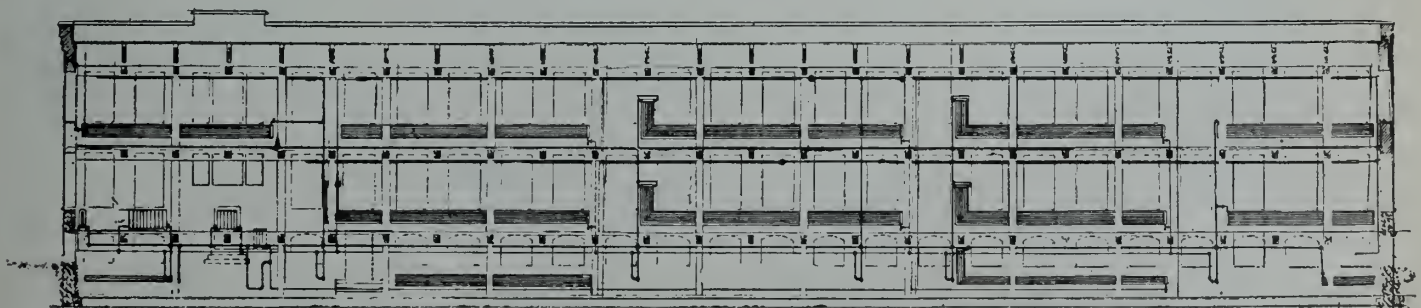
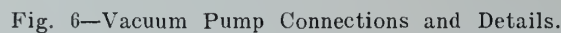


Fig. 4.—Section of Main Building, Showing Longitudinal Section Looking South.

Another and important advantage is the extreme lightness of the machines

produce a thread, clean cut and perfect, and of standard taper. The gradual backing away from the centre of each die segments relieves the operation from the friction-producing incident to all other dies, and there is the secret of the ease in operation. The Canadian licensees of these tools are



The Jardine No. II, taking from 1-inch to 2-inch inclusive, is supplied with left-hand dies, while the Tolledo tools are for right-hand construction entirely.

Technical drawing of a valve assembly, showing a side view of a valve body with three ports and a handle.

consequently gradually reeeding surfaces of the slots and pins, the range of variation being accurately gauged to

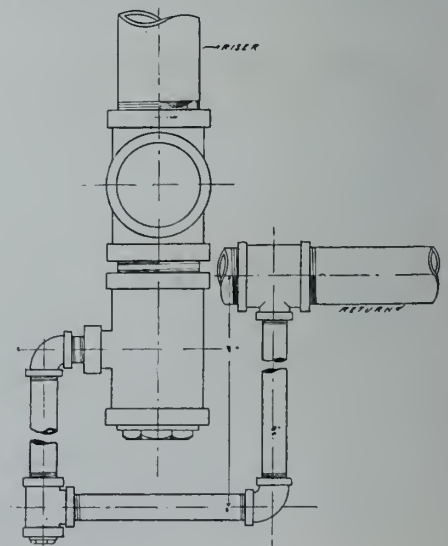


Fig. 9—Drip Loop.

Novel Advertising Done by Plumbers

How a St. Thomas Firm Got the People Guessing the Week Before Christmas
—One of the Partners Narrowly Escapes Election As Alderman.

Novelty advertising is not supposed generally to be within the province of the plumber, but, in St. Thomas, Ont., there is a firm that prefers to be the exception to the rule and every little while they give a real surprise to the citizens. It may not be exactly a motto but it's apparently a guiding rule for the firm "that it's a pretty recent arrival to St. Thomas who doesn't know of Hamilton & Stott."

Hamilton & Stott supplement their newspaper advertising with publicity-getters that the other fellows don't think of. They haven't yet offered a free bath to anyone who would test their bathroom fixtures—but it wouldn't surprise anyone if they did.

galvanized iron around the outside. The windows of the doors were also curtained. A placard was put up announcing that on Christmas eve a turkey would be given to the person guessing nearest to what farm yard live stock the window would contain at eight o'clock that night. The announcement was also made through the newspapers.

A half-hour before the hour named the street in front of Hamilton & Stott's was crowded. The guessing closed at eight o'clock and then a couple of pigs, a pair of rabbits, a couple of hens, a turkey, a duck, a pigeon and a pheasant were put in the window. Two newspaper men did the judging and the guesses they went

ran for alderman in the recent municipal contest in St. Thomas and though he wasn't elected he proved his popularity by a large vote. Next year, his friends say, "it will be a lead-pipe cinch."

The firm commenced business in 1900, both being practical mechanics, Mr. Stott looking after the heating and plumbing department and Mr. Hamilton the sheet metal work and furnace department. Their business gradually growing forced them to seek larger quarters, where they are now at—445 Talbot St., and employing ten employees. They carry a large stock of iron pipe and pipe fittings, and a complete line of plumbing goods, gas fixtures, gas globes, mantles, etc. Some of the heating jobs the firm has installed are: The Myrtle St. School, heated by the low pressure steam, the Separate School, heated by low pressure steam, the Free Library and the Home Bank, heated by hot water.



Novel Window Display that had the People of St. Thomas Guessing.

The nearest they ever got to "ducking" in the window was the week before Christmas when they filled one window with a big tin basin and put live fowls into it—ducks. This in itself was enough to attract the attention of passers-by but their enterprise didn't stop there—they put something else into the other window. And just because nobody knew what that "something else" was, everybody wanted to know—and that meant everybody was talking of Hamilton & Stott's.

This was the way the scheme worked. First one window was completely closed to the public view by nailing up of

through were most amusing. Some guessed everything in a farm yard from an owl to a bull. One guesser even included a local donkey, while another wishing not to slight any live creature added fleas to his list.

When the judging was concluded it was found that a 14-year-old newsboy had defeated a well-known lawyer in a close race besides scores of others who were farther behind. The novelty was the talk of the town but everybody said "that it was just like Hamilton and Stott."

Bert Hamilton, one of the partners,

WATER HEATER.

An improved heater, invented by E. E. Kehnert, is adapted for domestic and shop use. The water is heated by gas, and the volume of the latter admitted to the burner is automatically regulated by the quantity of hot water drawn off. Springs, stuffing-boxes and some of the other usual adjuncts of heaters of this class are dispensed with, and the inventor arranges the gas and water controlling valves, and means for operatively connecting them in one and the same casing, whereby he attains a maximum of simplicity, and efficiency in operation.

Rehabilitation of Customers' Gas Piping

Part of a Paper Read by John C. D. Clark Before the National Commercial Gas Association.

There is no question that in any good-sized town that has been in existence for, say, fifty years, some of the customers' piping is entirely too small to serve the gas appliances which they now have, and if any more appliances should be added to their piping they would not get satisfactory results.

For years past gas companies have been running pipes for appliances, but I have never heard of a case where a gas company made a first installation that they ever ran any pipe larger than required by the appliance installed.

It has been common practice to go in to a man's premises who is just commencing to use gas, and if his first purchase is that of a range, if the distance is not too great, to run $\frac{3}{4}$ -inch pipe from the meter to the range. Then, if a water heater were subsequently purchased the heater would be connected to this first piping; and if a laundry stove or other appliances were purchased, they would also attach them to this piping. In this way the original pipe which was installed is made to become the fuel system and, of course, becomes too small to serve the purpose for which it was installed.

A systematic inspection of piping and fittings in almost any town will show that somebody will have to go to considerable expense in rehabilitating customers' piping. At the time the majority of the buildings were piped, no attention was paid to sizes, to allow appliances to be introduced later for the use of gas. To remedy this trouble in the future and provide means for the customer to get all the gas he wants, and at the time he wants it, a set of rules and regulations for running piping for fuel is herewith submitted:

Rules to Follow.

All new buildings should be equipped in accordance with these rules and regulations. These rules are based on the class of buildings the pipes are to be placed in. A residence that has a laundry, kitchen and three or four fireplaces should be figured about as follows:—Each laundry to be counted as one opening; each kitchen to be counted as three openings; each fireplace to be counted as one opening.

At the time the building is built, pipe should be run to supply fuel appliances at each of these locations. If appliances are not to be installed at the time the building is piped the fitter should be permitted to run the pipes to these locations and cap up. If in an old building the gas company receives an order to place a gas range, the necessary fuel pipe of the proper size should be run in the basement to supply all of the appliances that may be used in the building at any time.

In making the run through the basement, plug openings should be left in the fuel line opposite such fireplaces and other locations where fuel appliances are to be used.

In cases where water heaters are to be installed, a separate exposed run should be run direct from the meter to the location of the appliance. When ex-

posed piping is run it would be well to hang pipe so there is a $\frac{3}{4}$ -inch clear space between the pipe and the ceiling to admit tools for the purpose of cutting run to insert tees.

Fuel System.

All piping for a separate fuel system must be taken from the service pipe, a separate meter provided, and must be run and used for supplying gas for fuel only.

No illuminating flames will be allowed, and no branches or outlets provided for other openings than those intended for fuel appliances, such as fireplaces, kitchens and laundries. Illuminating burners will positively not be allowed on fuel systems under any circumstances.

Rules Governing Size of Pipe.

To govern the size of piping to be used for fuel systems, the following rules should be followed:

Consider that each apparatus will be used to its maximum, and all pieces at one and the same time. Use as a basis for figuring pipe the following in ordinary residences and flats: Kitchens, 3 openings; laundry, 1 opening; each fireplace, 1 opening. An opening is figured

$1\frac{1}{4}$ -inch opening=seven $\frac{1}{2}$ -inch openings, or four $\frac{3}{4}$ -inch openings, or two 1-inch openings; one $1\frac{1}{2}$ -inch opening=twelve $\frac{1}{2}$ -inch openings, or six $\frac{3}{4}$ -inch openings, or three 1-inch openings; one 2-inch opening=twenty $\frac{1}{2}$ -inch openings, or ten $\frac{3}{4}$ -inch openings, or five 1-inch openings, or three $1\frac{1}{4}$ -inch openings, or two $1\frac{1}{2}$ -inch openings.

If exact number of openings required is not given in the table, use the next larger size of pipe. Openings one-half inch in diameter will be allowed only when the maximum amount of gas to be used through them does not exceed fifty cubic feet per hour for each opening.

TABLE II.

Length of Pipe.	Inches.
Do not run over 15 feet of.....	$\frac{1}{2}$
Do not run over 50 feet of.....	$\frac{3}{4}$
Do not run over 80 feet of.....	1
Do not run over 100 feet of.....	$1\frac{1}{4}$
Do not run over 150 feet of.....	$1\frac{1}{2}$
Do not run over 200 feet of.....	2
Do not run over 300 feet of.....	$2\frac{1}{2}$
Do not run over 400 feet of.....	3
Do not run over 500 feet of.....	4

Residence or flat of twelve rooms or under: Kitchen openings, not less than one inch; laundry openings, not less than one-half inch; fireplace openings, not less than one-half inch.

Residences or flats of thirteen rooms and over; Not less than one inch; not less than three-quarters inch; not less than one-half inch.

All Ruud, Monarch and Columbia water heaters and heaters of this type

TABLE I.

Size and length of tubing and great est number of openings allowed in piping buildings for use of fuel gas.—This table for dwellings, apartment houses and flats only.—Length of pipe in feet.

Openings. Number of	Pipe $\frac{1}{2}$ -in.	Pipe $\frac{3}{4}$ -in.	Pipe 1-in.	Pipe $1\frac{1}{4}$ -in.	Pipe $1\frac{1}{2}$ -in.	Pipe 2-in.	Pipe $2\frac{1}{2}$ -in.	Pipe 3-in.	Pipe 4-in.
1.....	15	50	80	100	150	200	300	400	500
2.....	...	30	60	100	150	200	300	400	500
3.....	40	100	150	200	300	400	500
4.....	20	80	120	200	300	400	500
5.....	50	100	200	300	400	500
6.....	30	80	200	300	400	500
7.....	25	70	200	250	350	500
8.....	20	60	150	250	350	500
9.....	50	120	220	300	500
10.....	40	80	200	300	500
11.....	35	70	180	250	400
12.....	30	60	150	220	400
13.....	25	50	120	200	350
15.....	20	40	100	150	300
20.....	30	70	120	250
25.....	25	50	90	200
30.....	20	40	60	170
35.....	30	40	150
40.....	20	30	120
45.....	25	100
50.....	20	80
65.....	60
75.....	40
100.....	20

to be one-half inch. For large buildings, consult the company for sizes of piping required. No fuel opening should be less than one-half inch. In figuring up the number of openings to be supplied use the following relations:

$1\frac{1}{4}$ -inch opening=seven $\frac{1}{2}$ -inch openings; one 1-inch opening=four $\frac{1}{2}$ -inch openings or two $\frac{3}{4}$ -inch openings; one

should be provided with separate runs as provided in the following table:

TABLE III.

Columbia	Monarch	Ruud	No. of Openings.
No. 0	No. 0	No. 3	7
No. 1	No. 1	No. 4	7
.....	No. 2	No. 6	12
.....	No. 3	No. 8	20

Hotels, boarding houses, restaurants, etc., should be considered special. The table is sufficient to cover almost any case of fuel piping sizes that may arise, but it is advisable for architects, builders and others installing fuel piping systems to confer with the company's inspectors on all such installation in large buildings. Openings for fuel appliances should, as a rule, be twelve inches from the floor and project one and a half inches clear from the finished wall. All other rules for piping and inspecting not inconsistent with these will be the same as for the illuminating system.

TABLE IV.
For Gas Engines.

Size of Engine.	No. of Openings.
1 horse-power	4
2 horse-power	7
5 horse-power	12
7 horse-power	12
12 horse-power	20

Supply for gas engines must be separate, and an independent service will be required, unless a governing holder or other similar device, acceptable to the company, is used. It is advised that before proceeding with the installation of gas engines, or piping for them, consultation be had with the gas company's inspector.

Correspondence Page

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

WHAT PROFIT DO YOU GET?

Editor Plumber and Steamfitter,—Your editorial headed, "What Profit do You Get," touches on a point that interests every plumber and steamfitter and the entire commercial community.

It is perfectly safe to say too many of us get much less than the risk and character of our work justly deserves, and which we should rightly exact, notwithstanding, we are quite often credited with getting a great deal more than we are entitled to.

In too many cases jobs are taken on for one fancied reason or other, at prices that ensure little or no profit, and where a profitable business is not being done it is hard to meet bills that fall due.

Sometimes work is taken "at cost," with the expectation that a future profit will be realized from some future work that never materializes. Every piece of work should yield a fair profit—one takes more interest in such work and the person for whom the work is done is better pleased with the work in the end.

Many expenses and unforeseen losses creep into every job, so that if a legitimate profit is not figured in the first place there is sure to be a loss when the work is finished and settled.

Experienced competition is not harmful, but experience in the work itself is not the only necessary element in our trade—experience in merchandising is also quite as necessary to all of us who wish for success in our undertakings.

In too many cases tenders are put in for work at ridiculously low prices, quite often from too much haste in preparing tenders or without due regard to all the various elements that enter into the work.

As showing the spirit with which such tenders are sometimes submitted, I might illustrate a case that came to my notice a short while ago.

A good-sized business block was up for plumbing and heating, and "A" in some way learned that "B" would be favored with the work at an equal price and that he would have a knowledge of prices beforehand. "A" was experienced in the line and "B" was not as well in-

formed along business lines, so "A" put in a figure at a price that he knew he could not do the work as he would not be awarded the contract under the circumstances. So, as expected, "B" learns the figure and is offered the work at the lowest tender, which he willingly accepts.

The result, "B" loses money and the owner has a most unsatisfactory piece of work, and now "B" is out of business.

But as before, there will be more

IS THIS CONNECTION CORRECT?

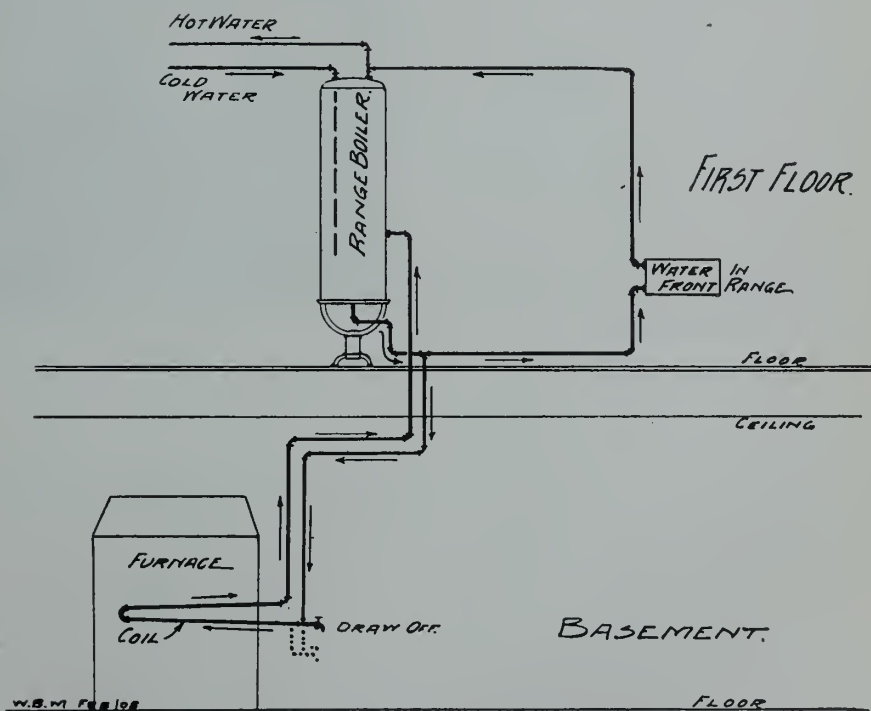
"W.J.G.," Montreal, writes: "I have had a dispute with an architect over the connections of a hot water boiler to a furnace. I want your experts to answer in your paper whether I am right or wrong. I will make a rough sketch of the connections, by which you will find I connected the hot water from furnace to the side of boiler and the connections from the stove to the top of boiler, so as to avoid making steam. The architect says if I take away the stove I will not get hot water. Remember, I have a coil in furnace made of $\frac{3}{4}$ -in. galvanized iron pipe, the same as I have in my own furnace and I can raise steam with it."

Our correspondent's sketch is shown in Fig. 1. It is not stated that there is any trouble with the work as far as the results are concerned. The connections, as shown, are quite usual, and there are no reasons why the results should not be satisfactory if ordinary care and management is exercised.

We assume that the hot water supply to the house is taken off at a point higher than the connection from the range to the boiler directly above the boiler as is indicated in the drawing.

We would suggest that 1-in. pipe would be better for the coil than $\frac{3}{4}$ -in. pipe and that copper pipe would be better than galvanized iron pipe, in fact, we cannot see that galvanized iron for a coil in a fire is any better than black-iron pipe.

Also, we might suggest that if there is a tendency for the direction of circulation to reverse in the circulating pipes, connecting the coil to the boiler that the trap or loop indicated by the



"B's" to spring up and go through the same experience. "All is not gold that glitters," and all is not profit, however it may have that appearance, and "glory" won't pay overdue accounts.

SUBSCRIBER.

Peterboro, Feb. 1, 1908.

dotted lines would be the best remedy. The draw-off, of course, is to be placed at the lowest point.

If there is any real trouble with it in the operation it would lie in some of the details of the work and not arise from the general lay-out or plan.

NEWS OF THE TRADE IN CANADA

The Dominion Government has decided to erect a post office building at Grand Forks, B.C., to cost about \$35,000.

The H. R. Rickey Co., plumbers, Montreal, have been granted a winding-up order. A meeting of creditors will be held on Jan. 27.

Fred. Smith, plumber and steamfitter, Guelph, has been appointed skip for the Royal City Curling Club for the Ontario Tankard.

Building permits for January in Vancouver reach the total of \$131,800, an increase of \$40,000 over those of the same period last year.

F. V. Newell, Chicago, has prepared plans for a large summer hotel, which will be built on Newel Island, about five miles from Kenora, during the summer months.

A hockey team composed of employees of the James Morrison Brass Manufacturing Co., Toronto, have registered in the Markham Hockey Tournament, which starts next week.

Excavation has been started for the James Morrison Brass Mfg. Company's new four-storey brick factory and warehouse, Toronto, which will be erected at a cost of \$60,000.

John McKelvey, of the firm of McKelvey & Birch, plumbers, etc., Kingston, who was confined to his home last week, through illness, has recovered, and is able to be around again.

A joint stock company, with an authorized capital of \$150,000, known as "The Brass and Steel Goods, Ltd.," has established a factory at Campbellford for the manufacture of brass goods.

The following figures show some of the larger buildings now being proceeded with in Calgary: New Court House, \$225,000; Registry Office, \$120,000; C.P. R. Depot, \$225,000; City Hall, \$150,000; Normal School, \$130,000; High School, \$70,000.

ized at \$20,000, and the head office will be at Sarnia. The provisional directors of the company are William and Leo Brabant, of Detroit, and F. V. Brabant, Chatham.

William H. Stirling, a St. John man, has secured a patent for a new boiler injector invented by him. The patents are offered for sale by H. R. McWeelon, of this city.

"The objects of the invention are to simplify the construction of an injector, and so arrange the parts that the turning of the handle of the main valve stem will cause all operation of the several parts to act in proper sequence, whereby the valve may be operated by a single motion, to provide means whereby the overflow valve will close automatically under steam pressure, and be retained in position by suitable means, to provide means by which the heating of the injector may be carried out, without any interfering with the work thereof, and in which breaking off of the feed current, due to leakage, through the overflow valves, may be prevented; further objects being to ren-

der the device of such a character that it may not be easily tampered with, to break the continuity of the feeding current and to provide means whereby the heating of the injector may be carried out independently and without interfering with the operation thereof."

TRAVELER CHANGES POSITION.

Emile Dansereau, for the past six years Montreal city and Eastern Townships representative of Warden King & Sons, Montreal, has accepted a position in the traveling staff of the Taylor-Forbes Company, and will hereafter sell Sovereign radiators and boilers in the cities and towns throughout Quebec Province.

Before joining the Warden King & Co.'s staff, Mr. Dansereau had been for some years bookkeeper for Jos. Thi-beault, one of Montreal's best known master plumbers, looking after the heating contracts and making up of estimates. He is, therefore, well equipped



EMILE DANSEREAU, MONTREAL.
Taylor-Forbes Co.'s New Traveling Representative in Quebec Province.

for his new position, having in addition a splendid connection with the French-Canadian trade throughout Quebec. Mr. Dansereau also speaks both English and French fluently.

MONTREAL PLUMBERS' NEW OFFICERS.

At a meeting of the Master Plumbers' Association of Montreal, held in the Plumbers' Hall, Montreal, John A. Gordon was elected President in the place of N. Turcot; J. Laurier, First Vice-President, in the place of J. A. Gordon; R. J. McAuley, Second Vice-President, in the place of J. A. Marier. L. J. Conroy was elected Secretary, in the place of J. E. Walsh, who resigned through press of business. The Trustees elected

were J. E. Walsh, D. Dugas and N. Breton. P. C. Ogilvie was appointed chairman of the Sanitary Committee; O. Galarneau chairman of Arbitration; N. Turcot, Legislature, and H. Munday, Apprentice. The Auditing Committee was elected as follows. J. Watson, A. Fontaine, W. Aitchison.

The retiring officers were given a hearty vote of thanks, and general regret was felt that J. E. Walsh could not see his way clear to continue as secretary for another year. Ways and means were discussed at the meeting for bringing the Association back to its former standing, and confidence was expressed that renewed prosperity would attend such efforts.

L. J. Conroy, who has just turned 22, is the youngest master plumber, and belongs to the youngest firm of master plumbers in Canada. Born and educated in Montreal, he learned his trade with the late J. P. Conroy, and the firm now consists of Peter J. and L. J. Conroy. Mr. Conroy started buying goods when he was 14 years old, at which time he was a partner in the firm, and he has had full control of all the buying from that time on. This is surely a record for young ability and enterprise. Mr. Conroy makes a specialty of dealing with only a few firms, and the firm that he is now buying from are the same concerns he started with.

BANQUET AT EDMONTON.

The Edmonton union of plumbers and steamfitters held their annual banquet in the Club Cafe a fortnight ago and spent a very enjoyable time. Among those present were: Dr. Ternan, medical health officer, and master plumbers J. W. Moulds, A. Lee, J. A. Lockerbie, C. Frost, A. J. Kemp and W. J. Carmichael, who has recently opened up business in the city. Dr. Ternan said that he thought the plumbers of the city were taking a step in the right direction by petitioning the legislature to pass laws whereby all plumbers must pass a satisfactory examination and thus show that they are fully qualified to carry on a business which, if left without the qualifying work, does much to injure the health of the district. He hoped that the legislature would see the force of this and legislate accordingly. The West is attracting all kinds of people and among them the failures. It would be very detrimental to allow these people to install plumbing work which would be a menace to the health of the occupants of any building and therefore he heartily endorsed the action of this body in asking for the providing for the registration of plumbers.

J. W. Moulds, replying to the toast of the "Master Plumbers," said he was in favor of paying the highest wages possible, but he wished to be understood that a rate of wages should be decided upon which would allow them to compete for outside work with a hope of getting their fair share of it.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Feb. 10.—The recent extremely cold snap has made plumbers very busy, and there is a bustle about the various shops which has been absent for some time. Zero weather gives plenty of opportunity for jobbing work, although on the other hand, it does not facilitate the carrying out of a contract. It is not easy to work in unfinished buildings during severe cold weather, but when the thermometer is away below zero the task becomes too arduous. If, however, the large plumbers are handicapped in their contract work, repair orders for the time being make up the deficiency, while to the smaller man the weather is proving a little gold mine.

The opinion is growing that building operations after all will not suffer the set back that was at one time anticipated. There is no doubt that there is less work offering than at the commencement of last year, while the prospects on the surface are not so favorable, there is plenty of time for recovery before the spring opens, and the impression is growing that this recovery will take place. The present colorless state of the building market is due rather to the holding back of plans by landlords and architects for a time, than to any real set back to future building activity. Probably there is still some uneasiness as to how the money market may shape, which would account for this delay. We are inclined to think that the building permits for 1908 will not be far behind those of last year.

Iron Pipe—There is little business offering, and manufacturers do not expect any signs of activity until March. Stocks are getting well assorted, and the season promises to start in better shape than it did last year. Prices are unchanged at \$5.61 for 1-inch black, and \$7.26 for 1-inch galvanized.

Soil Pipe—There has been a slight increase in the demand, but it is not expected that it will be maintained for long. Stocks are fairly ample and a few isolated orders for spring delivery are coming in. We quote 60 and 10 off new list.

Lead Pipe—The cold snap has stimulated the demand, and for the time being there is plenty of lead pipe going out on repair work. There has been no further cut, and we quote lead pipe and waste at 20 per cent. off. Prices for traps and bends remain the same.

Solder—Like the other lines affected by activity in jobbing work, solder is moving freely, and will do so until the weather eases up. Plumbers are inclined to let their stock of solder run low, and when orders pour in for repairs, the demand becomes heavy. We still quote half-and-half 19c and wiping 18c for fair size orders.

Enamelware—The cut of \$1 on special ware bath tubs still continues, but a revision is expected soon. American

dumping is still being continued, but Canadian lines are well holding their own despite the cutting of prices. Orders for spring delivery are slow, and the rush will be late in opening.

Brass Goods—The sale for the cheap brass articles that are thrown upon the market here is falling off, and it looks as if users were beginning to realize that true economy lies in having the best class work. Despite the cutting, the well finished article is maintaining its price on a quiet but steady demand. We still quote standard compression work at 57½ to 60, and fuller work 65 per cent off list.

Radiators and Boilers—But for a few contract orders still outstanding, the demand for radiators would be practically dead. Manufacturers are working up good stocks. Boilers are likewise slack. Parts are going out somewhat freely owing to repairs. Quotations are 50 and 10 off list.

Metals—The markets are steady, despite outside fluctuations, and we quote: Ingot copper, 15c; ingot tin, \$32; lead, \$4.50; pig iron, \$21.50 for Middlesboro, No. 2, \$20.50; Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, Feb. 10.—The cold snap has increased business among the local plumbers to an appreciable extent. Contract work is at a standstill but repairs resulting from the bursting of water pipes have more than made up for the work temporarily at a standstill as a result of the cold weather. Orders for lines affected by the cold weather have also increased in demand and the supply houses are shipping a fair amount of lead pipe and solder.

Building prospects are beginning to look brighter in Ontario. A large number of contracts have already been let and from the west come reports of a large amount of building which is to be started in the spring. Though it is too early to decide whether as large an amount is to be expended this year as in 1907 for erecting buildings the number going up will likely be large enough to keep the trade busy during the summer.

Iron Pipe—Stocks are large enough to satisfy all demands and prices, which have remained firm since the new year, have undergone a temporary increase of one cent in some sizes. There is a fair demand for common plumbing sizes at present.

Soil Pipe—The market is quiet and firm. Prices remain as follows: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent. and fittings, 60 per cent.

Lead Pipe—The demand has increased lately, owing to the repair work caused by the recent cold snap. No further changes have been noted since last writing. We still quote lead pipe and waste at 20 per cent. off list. Caulking lead remains at 5½c per pound. Traps and bends are now quoted at 60 per cent.

Solder—This market has also felt the

effect of the cold snap and the demand is more active than for some months. A drop of one cent has been made general in Toronto this week. We now quote wiping solder at 18c and half and half at 19c.

Cast Iron Fittings—Supplies are plentiful, quotations remaining unchanged. One authority says prices have touched the bottom and will advance soon.

Radiators and Boilers—The demand is quiet at present, the season for radiators being practically over, while boilers have not as yet started to move. Quotations remain 50 and 10 off list.

Brass Goods—The demand is not extensive at present and prices have remained firm since last writing.

Enamelware—There is little movement in these lines at present. American manufacturers continue to dump their surplus product in Canada, this being the reason for the decline shown in the new list issued by the Standard Ideal Company, dated Jan. 20, 1908.

The Septic Tank sewage system on Woodbine Avenue, Toronto, is again in first-class working order. For a short period the tanks were not doing their duty, owing to the amount of sand and small gravel which was deposited around the valves and in the bottom of the tanks. This, however, was removed by draining off the tanks and the civic authorities report that the system is again working properly.

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RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

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Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

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In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

FOR SALE.

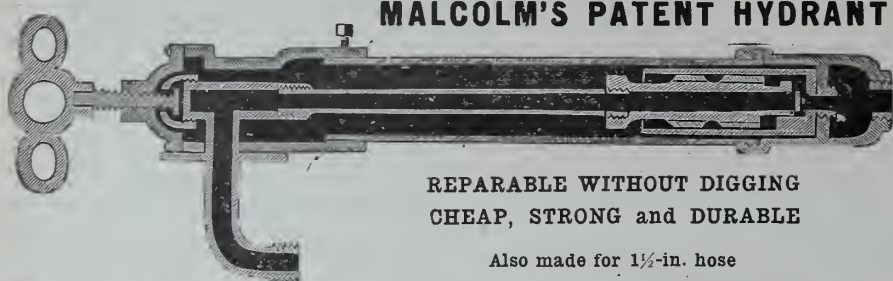
PLUMBER'S Cabinet for sale, cost \$75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATIONS VACANT.

WANTED—A traveler for Canada, to represent a large Canadian manufacturer; must have acquaintance with wholesale and retail plumbing trade, retail hardware and gas companies; only those who can absolutely fill the requirements need apply. Give references, age, married or single, salary expected. Address Box 684, PLUMBER AND STEAMFITTER, Toronto. (4)

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REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

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about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect ALL the items of information appearing in Canadian newspapers about any subject YOU are interested in. Our service is thorough. We don't miss an item. If you want ALL THE CURRENT INFORMATION about a pet subject, we can supply it at the lowest cost. By using our service you can KEEP POSTED on any subject.

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All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

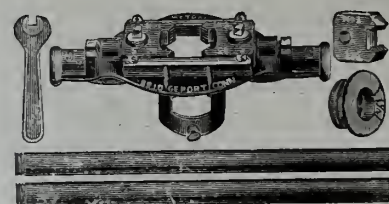
OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

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**The Armstrong Manufacturing Co.**

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

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Two Heads are Better Than One

You readily admit that, don't you? Then it shouldn't be difficult to convince you that the **CREAM** of a hundred magazines is better than the one or two periodicals you are now reading. Read what C. Edgar Wood, General Sales Manager Dominion Cartridge Company, of Montreal, has to say about **Busy Man's Magazine**:

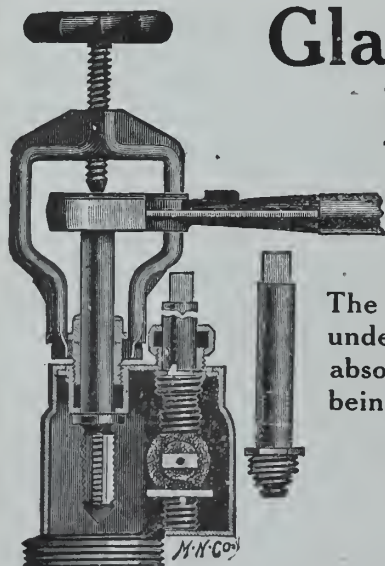
I cannot resist telling you how well I like the **Busy Man's Magazine**. It is the only publication that I keep a file of; in fact I have to because practically every article in the various issues has been blue penciled by me for future reference.

I have never found under one cover so much that will interest a business man. You have certainly succeeded in obtaining all the articles of value from the principal magazines of the world, and as a consequence I have not only been able to save a great deal of time by reading your magazine, but also a good deal of money. For instance, I had subscribed for 32 different publications. I now find that **Busy Man's Magazine** covers the gist of the majority of them.

This is exactly what the **Busy Man's** will do for you. Save you money—save you time, by giving you the most timely, interesting and instructive articles appearing in the world's magazines and periodicals.

Try it. Send a card for a free sample copy. Write us to-day.

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**Glauber Tapping Machines**

FOR ANY KIND OR MAKE
OF CORPORATION COCK.

The only machines that do the work under the heaviest pressure and are absolutely proof against accident while being operated.

SENT ON 30 DAYS TRIAL.

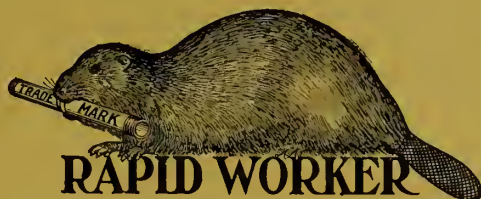
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Let Our Beaver
Do Your Work.

You Don't Have to
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Cuts 1, 1¼, 1½ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
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"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto

"SOVEREIGN" HOT WATER BOILERS

will make many friends for the steam-fitter who recommends them. More heat can be generated from less fuel in the "Sovereign" Boiler than in any other boiler on the market. "Sovereign" boilers are simple and easy to instal, and give the steamfitter no trouble. Hadn't you better know all the points of the "Sovereign?" Send today for our free illustrated booklet, "Simplified Heating."

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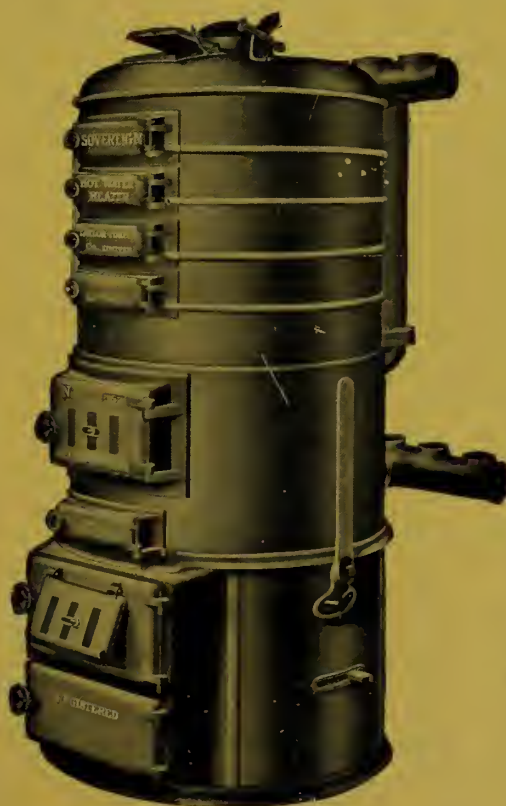
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of larger profits and greater satisfaction in handling

Standard Ideal Cast Iron Porcelain Enamelware

Made in Canada from designs calculated to meet every requirement of the trade. It is a ware that gives perfect satisfaction wherever installed.

We make Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, Etc.

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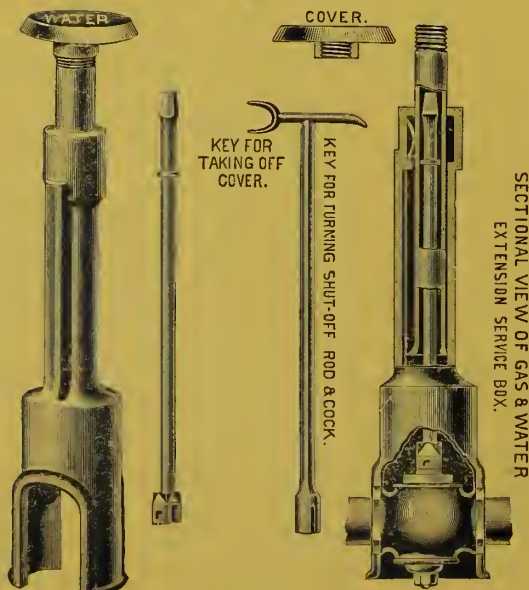
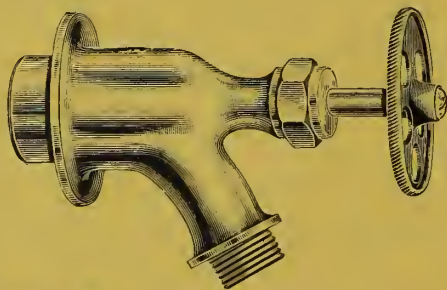
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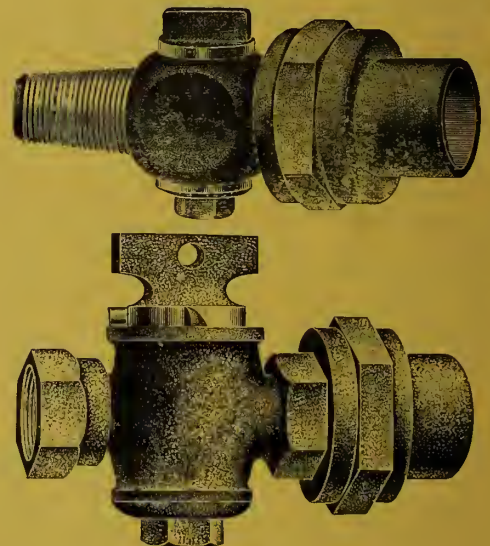
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THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

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Vol. II. No. 4. (New Series).

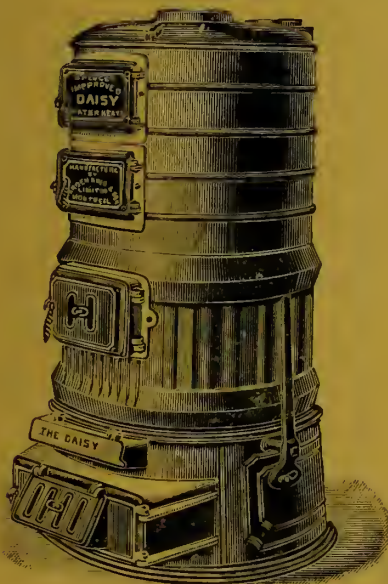
Publication Office : 10 Front St. East, TORONTO, FEB. 26, 1908.

Old Series, Vol. XX. No. 4

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There is no doubt in our mind that, if a heating apparatus is required at all, it is the intention of the home builder to provide the best that the market affords. It behooves the steamfitter, therefore, to recommend to his customer the boiler that he KNOWS is going to satisfy every requirement that is expected of it.

That means the selection of the DAISY HOT WATER BOILER.



FEATURES WORTH TALKING ABOUT

Each section is so arranged that it is practically an independent heater.

The Water Post by which the different sections are connected to the firepot permits any or all sections to be shut off without interfering with the proper functions of the boiler.

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When in the market for steamfitters' supplies of any style or quantity, remember that the contents of the largest warehouse of its kind in Canada are at your disposal.

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LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING and SON, Limited

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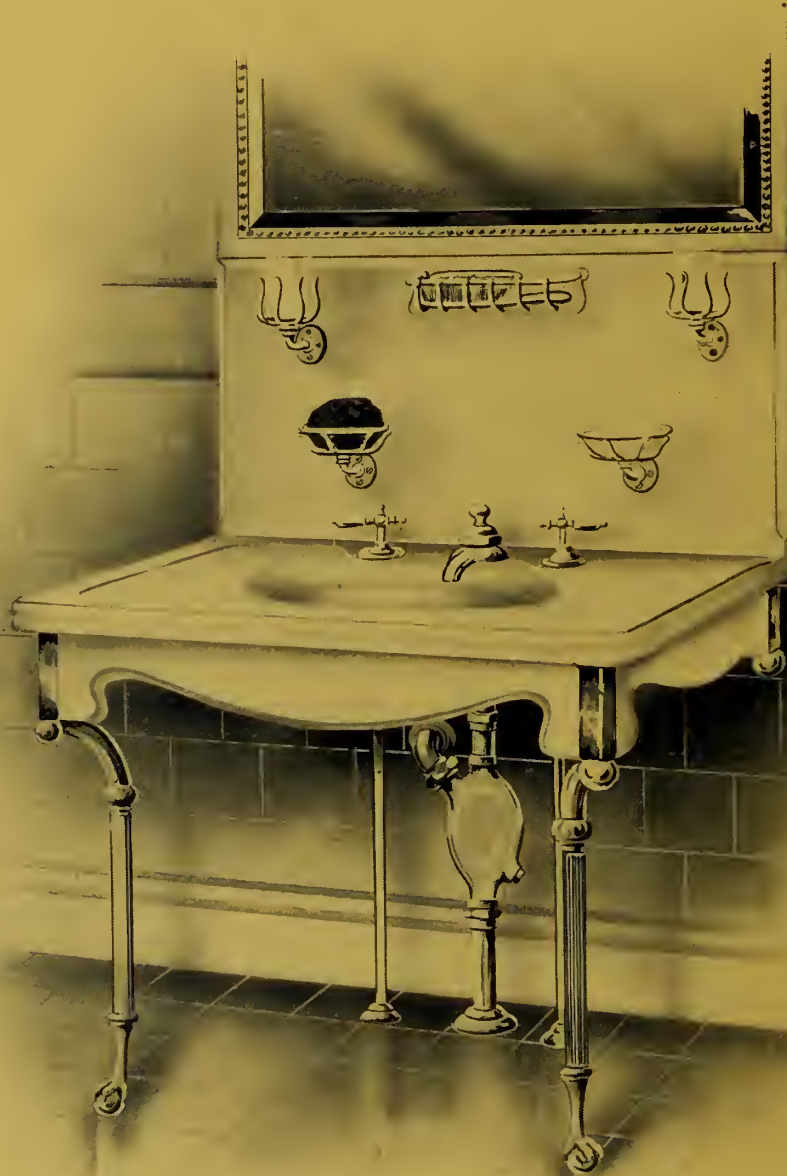


Plate E 90. List Price \$70.00.

We manufacture and carry in stock a full line of Plumbers' and Steamfitters' Supplies. Send us your enquiries.

The James Robertson Co. Limited
Montreal Toronto



Plate 508-E.

Metropolitan Close

Somerville's Metropolitan Closets are centripetal action syphon jet closets. They have 2-inch N.P. brass flush connections, a square back, Metropolitan seat, panel cover with offset hinges, a serpentine tank with china-tipped push button, 3/4-inch I.P. size N.P. brass supply pipe.

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WHY YOU SHOULD SELL THE DAISY

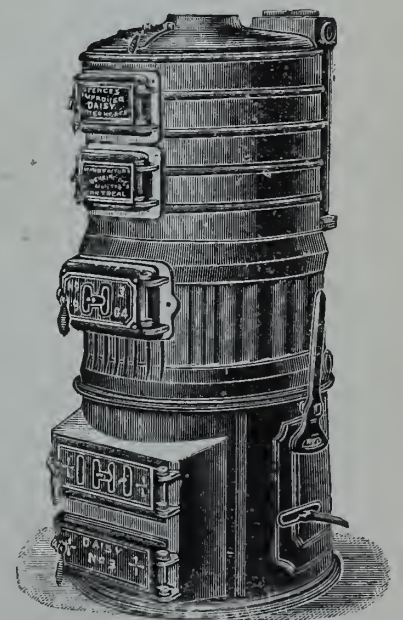
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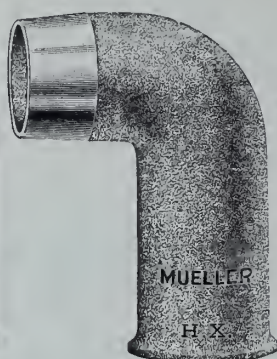
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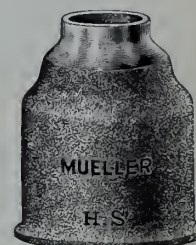
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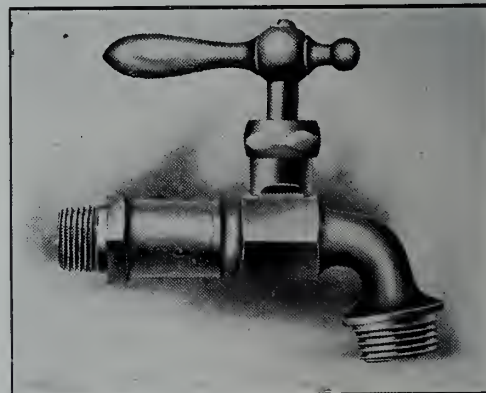
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The **Monarch people** make but **one grade** of **goods**, fully tried, fully tested. **THEN GET THE HABIT** of using their just-a-little-better-than-the-best **Fuller** and **Compression** work, **Hot Water Valves**, etc., etc. **All who use them get satisfaction. Get into line with the best Plumbers and Heaters** of the **Dominion** and be up-to-date.

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HIGH GRADE BATH ROOM FIXTURES

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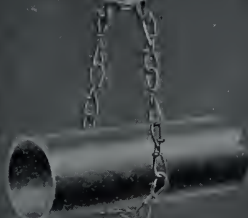
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NIAGARA CHAIN for PIPE HANGING

Most con-
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Pipe may
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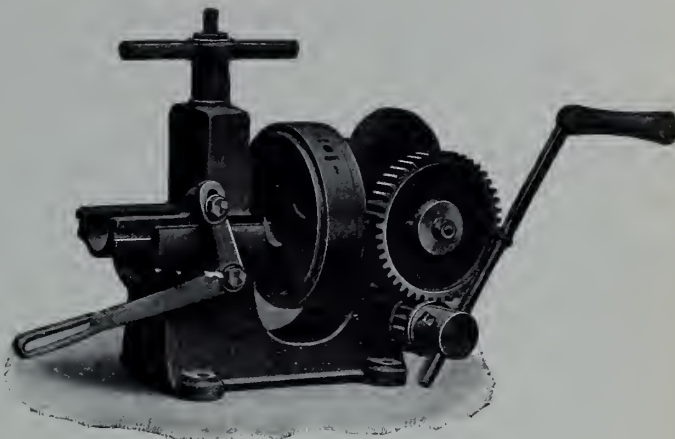
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Write for samples and prices.

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WINN'S PIPE FITTER'S SCREWING MACHINE

New Model Fig. 1027

This screwing machine has been designed to meet the demand for a lighter and cheaper tool, suitable for sending out to jobs, and embodies the labour-saving features of the more expensive machines as far as is possible at the price, but the necessary economy has been effected without prejudice to strength and durability, the best material being used throughout.

Price £10 : 10 : 0 complete

With Adjustable Four-chaser Dies.

To screw tubes $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 1 $\frac{1}{2}$ 1 $\frac{3}{4}$ & 2 inch, also Bends 1 $\frac{1}{2}$ 1 $\frac{3}{4}$ & 2 inch.
LIGHT AND STRONG.

Write for Full Particulars.



Steam & Hot Water Fitters



who handle KERR
VALVES are the lead-
ing men in their line.

You should use Kerr
valves for they improve
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Made by a long
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PLUMBERS

WILL YOU INCREASE
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J. J. Cosgrove's Book
PRINCIPLES AND PRACTICE
OF PLUMBING

will be sent you POSTPAID on
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most complete treatise ever written
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TECHNICAL BOOK DEPARTMENT

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Modern Conveniences for Farm Homes

The Ninth of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

INTRODUCING CONVENIENCES INTO HOUSES ALREADY BUILT.

It goes without saying that both plumbing and heating systems can be put into a house more conveniently at the time the house is being built; but if this has not been done there is nothing to prevent their being installed afterwards.

The installation of the plumbing may conflict with the routine of the household for a week, but as all pipes should be exposed, for sanitary reasons, aside from cutting through ceilings and floors

be built just as well to connect to an old house as to a new one, especially if no fixtures are placed in the cellar, and cellar fixtures should be avoided if possible, especially open drains in the cellar floor, even if trapped.

Figure 22 gives a general plan of the buildings on a farm in the Santa Clara Valley, California. As the contour lines show, both barn and privy are on ground higher than the surface of the well, the privy being on ground higher even than that upon which the house stands. The privy vault is never clean-

the water into it. Three hundred feet of galvanized iron pipe would carry the water to both house and barn. The changes to be made in the kitchen are very simple. The bedroom closet that extends into the kitchen could be taken out and a closet provided from one end of the storeroom. The storeroom is converted into a pantry. The wall of the present pantry is extended 4 feet, which changes it into a fine-sized bathroom. The sink and laundry tubs are placed along this wall, allowing all the fixtures to connect to one soil pipe.

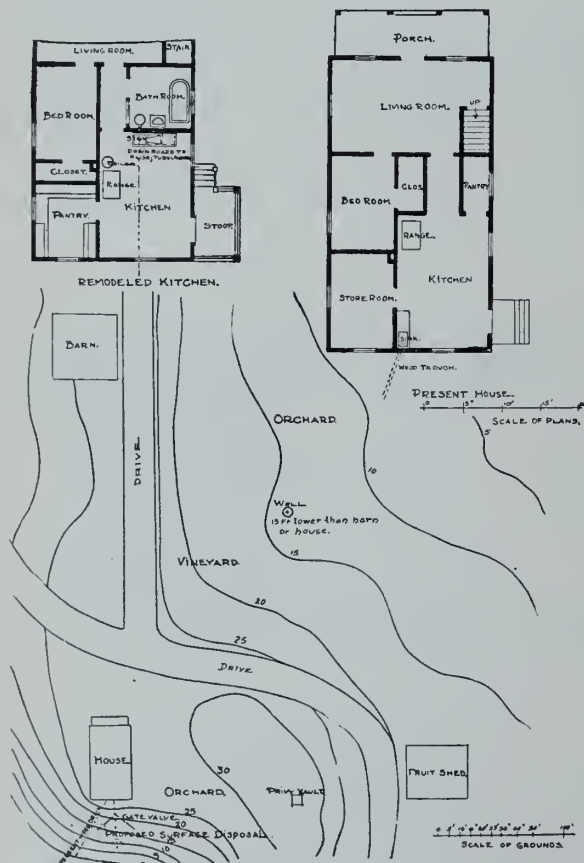


Fig. 22.—Present and Improved Plan for a Western Fruit Farm.

little inconvenience is met with in putting the pipes and fixtures in place. A water back can be fitted to almost any kitchen stove to supply heat to a small boiler, or a water coil can be placed in the combustion chamber of the furnace, which will furnish a more abundant supply during cold weather, and an independent heater, built to use any desired fuel, can be employed when there is no fire in the furnace. The waste water and sewage disposal system can

ed, but ashes and lime are used once in a while, and then the old vault becomes full a new one is dug. The water is carried up the hill to the house, a distance of 150 feet. The plan of the house as given shows the conveniences that could be added with slight changes.

An elevated tank is a favorite method of getting water pressure in California, as it is not necessary to provide against freezing, and one could be used in this case with a windmill or engine to pump

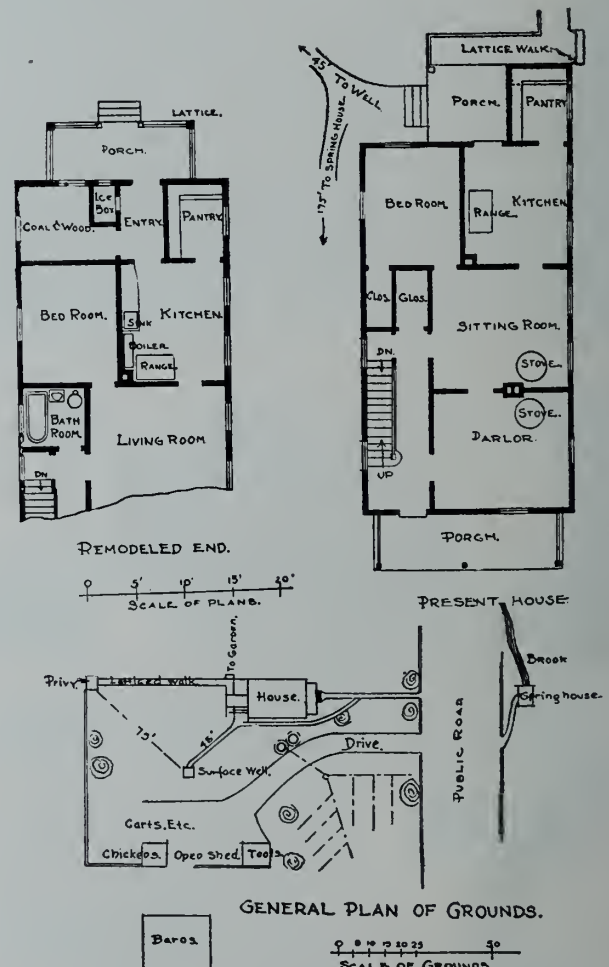


Fig. 23.—Present and Improved Plan for an Eastern Farm Home.

The surface disposal system could be used for the sewage, a single-chambered flush tank collecting the wastes and discharging them intermittently, by means of two sets of openings, over the steep side of the hill.

Figure 23 gives a general plan of the buildings on a farm in eastern New York with a plan of the house, drawn on a large scale, and a plan for the introduction of water into the kitchen and the installation of a bathroom.

At present a spring across the road furnishes water to a milk cooler and a spring higher up the hill would furnish an adequate gravity water supply for the house. The piping of this water to the kitchen has often been talked of, but has never been done. As the kitchen wing is only one storey high an attic tank could be put in over the kitchen and the water piped from this spring to the tank by $\frac{3}{4}$ -inch galvanized iron pipe. The overflow from the tank could be carried to a stock tank in the barnyard. A hot water boiler could be connected to a water back in the kitchen range and hot water be furnished sink, the bathtub, and the lavatory. A bathroom could be made by removing the partition between the two closets and putting a window in the outside wall. The waste pipe from the kitchen sink could be connected to the soilpipe in the bathroom. The disposal of the sewage could be obtained by the use of the subsurface irrigation system, the drain tile being laid in the grass lot across the drive, as shown by the broken lines on the general plan. The floor

from every possible angle. And how many there are who, having been curtly "shut up" and told to do it, waste still more time worrying and fretting.

These workers forget that the object is to get a thing done—and that the way it is done is secondary. If it is not done right, of course, there is trouble, but that is not the point. The arguments chiefly are as to differences in method in accomplishing the same end.

Only a few days ago I watched a heating contractor and steamfitter engaged in putting a steam pipe through an 18-inch wall, says John M. Master-son. The contractor explained briefly and concisely how he wanted it done. The steamfitter stopped, put down the pipe, and argued. He declared that he never had done that kind of work in that way, that he had worked for some of the best heating contractors in the country, and that they did not do it that way. He started to get technical and the boss shut him up curtly.

After hours that evening the two rode home together. The steamfitter had been pouting and sulking all afternoon on ac-

minutes of my time and your own, arguing about it.

"You'll never be a first-class steamfitter until you learn to do things the way the man you are working for wants them done and orders them done."

That was plain talk—but it settled Jack. He admitted frankly that he never had looked upon it that way.

That same day I watched two painters at work on a house. They were just starting. They set out barrels, brushes, buckets and ladders, and then spent 20 minutes debating whether to start with the roof or on the east side. The boss had just driven away after telling them to start on the roof. It was nearly an hour before they finally decided that he was right—and meantime they had soaked the house owner nearly \$1 in time—or the boss, if they were working by the job.

I see this tendency to bicker and waste time in small things in every line. I have a friend, a capable, even a brilliant man, who wastes hours every day fretting himself over small quarrels, fancied slights, neighborhood rows, etc. Instead of simply passing them over as not worth while he is keeping himself from doing something really big in the world by letting the small things occupy his mind and his time. Just at present he is wasting an hour or two a day telling people about a grievance he has, and planning revenge. The grievance is against a firm that he employed to clean some oriental rugs and which almost ruined one of the rugs in the cleaning.

The rug, to my certain knowledge, cost \$85, and this man, since the accident, certainly has wasted at least \$100 worth of valuable time kicking about it.

The wise man is he who knows whether or not a thing is worth while arguing about, or "raising a row over." He certainly cannot afford to waste either his own or his employer's time in petty bickerings.

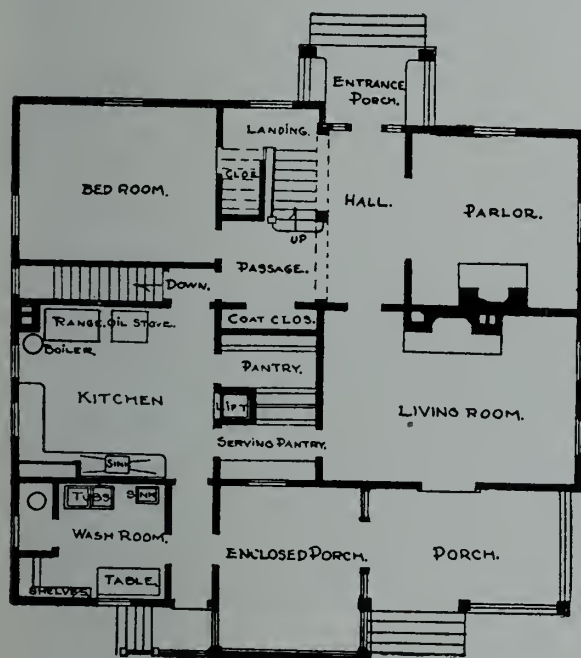


Fig. 24.—Plan for Farmhouse.

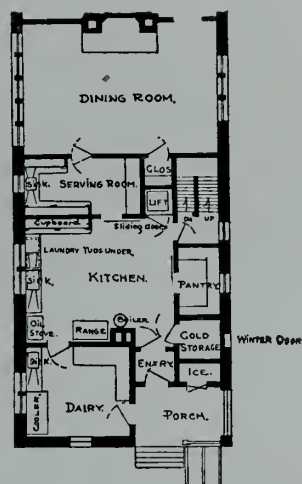


Fig. 25.—Plan for kitchen.

of the back porch could be extended and a woodhouse built here to furnish fuel for the kitchen range. A small furnace in the cellar would not require much more coal than the two heaters now used and would make the rooms more comfortable with less work.

The requirements of no two families are ever the same, but these suggestions of improvements are made with the hope that they may be a help in solving similar problems.

DO IT WITHOUT ARGUMENT.

Argument and bickering and worrying over small things is one of the greatest evils in the working world. Procrastination merely is petty larceny of time as compared with argument.

How many workers there are, who, when told to do something, stop to debate or bicker over the manner in which that thing is to be done. How many there are who want to argue the point

count of the reprimand. This time he found the boss ready to argue, and they engaged in a long and technical debate. Finally the heating contractor remarked:

"Jack, this is your worst fault. You don't know how to obey orders. In the first place, when I tell you to do something you are likely to start without knowing exactly what I want. Never do that. Always find out, before attempting any work, exactly what is wanted."

"You don't know how to take orders. This is my job, and I am responsible. I tell you to do something. When I do that it is up to you to do that work and do it my way. It may not be as good as your way, but that is the way I want it, and, as I assume all responsibility, that is the way I'm going to have it."

"You knew just as well as I this morning how I wanted that pipe connection made. Instead of making it that way, you wanted to try it some other man's way. You wasted over five

GENERAL BRASS WORKS.

The General Brass Works, Limited, Toronto, are now settled in their new brick factory on Sterling Road. The company established a small plant in Toronto three years ago, and until last year occupied a flat on Richmond St. A growing business, however, made necessary a change of quarters, and a brick factory with a floor space of about 15,000 square feet was built for them on Sterling Rd., near Dundas St. bridges, where lines of taps, fuller and compression work, globe valves and closet combinations are being manufactured, each article being covered by the firm's patents.

At the present time about 75 skilled workmen are employed at the Toronto plant and the number will probably be increased to 100 when the spring business opens up.

The manager of the works, Murray Woodbridge, holds an optimistic view of the business prospects for 1908 and looks for a large trade from both the Toronto headquarters and the Vancouver branch of the company.

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BUILD UP GOOD REPUTATION.

The firm that builds up a reputation for doing good work is the concern most likely to live through a period of dull times. When trade is brisk and new buildings so plentiful that every plumber and fitter has his desk covered with orders the temptation to rush the work and boost prices is strong but the man who is building for the future will not take advantage of his customer at such a time any more than he will let his customer beat down the price of a job to meet figures submitted by unscrupulous competitors.

Some firms make a profit on low-priced work, some even making a practice of buying up enamelware seconds, etc., and in league with speculative and dishonest builders, install these goods in cheap houses to be sold to hardworking mechanics to whom cheapness is a

necessary consideration, but who soon find that their purchase was a decidedly dear one. Condemnation cannot be meted out too strongly upon plumbing and heating firms stooping to do such business. The whole trade suffers in reputation and the word "plumber" becomes a byword and the public led to believe that all plumbers scamp their work in order to reap a harvest on repairs.

The wisest course is to build a permanent reputation for good work, reasonable prices and business integrity. When a customer wants a cheap job tell him that a good job is the cheapest in the long run, that cheap fixtures will soon need repairs and that the health of the family can only be ensured by the most modern conveniences. Then do a good job and point out to the customer where the job is good and where it could have been scamped. The customer will be a friend and a walking advertisement for your shop.

The strongest test of the steamfitters' work is satisfaction in severe weather. Keep this in mind when talking with a prospective customer. Let him know that if he orders a small-sized boiler that he cannot honestly blame you if his house isn't warm during a cold spell. Point out that houses are not built so securely to-day as ten or fifteen years ago, that builders are not so particular about having windows and doors air-tight, that where so many leakages occur the heating plant is often blamed for the poor work of the builder and this can only be safeguarded by putting in a plant capable of handling the most severe weather. It is a wise course to examine a building and proportion the heating equipment after a personal examination rather than relying altogether on a set of architect's plans.

Build up a reputation for good work and not only will the standard of the trade improve, but the firm will often be able to secure contracts at higher prices than those quoted by concerns whose figures are lower but whose reputation is not so good.

MAY SETTLE DIFFERENCES.

It is possible that a settlement of the differences between Toronto masters and journeymen may be arrived at during the coming month. A better feeling exists and after ten months of a struggle a more reasonable agreement can probably be drafted than at the beginning of the controversy. Both masters and journeymen have stood firm during

the strike and while both have won points of vantage both have lost money during the ten months' fight. With a general slackening of activity and a surplus of workmen in the city it is in the interests of either side to reach an early settlement.

A PRACTICAL SUGGESTION.

Discussing the working of heating plants during severe weather conditions the Metal Worker points out that the heating contractor may use good judgment and install an amply large heating system, but he cannot escape, any more than his less capable and conscientious competitor, the many who know little how to run a fire to get the best results in severe weather.

People are apt to reach the conclusion that they have a good fire when the surface of the fire shows red hot coals, though they should have the firepot full of burning coals from the grate level to the fire door, and not half full of ashes, as is frequently the case. The excessively economical think they are practicing their hobby when they put a little coal on the fire very often.

While it may not be justly a part of the duties of the heating contractor to look into the service rendered by his equipment, he will strengthen his standing if during severe weather he looks up his customers and sees how they are getting along, and instructs either the caretaker or the servants, as well as the head of the house, as to the proper way to run the fire to get the best results when even the zero mark is lost sight of by the mercury.

TORONTO'S SEWAGE PROBLEM.

Prospects are bright for an early settlement of the sewage disposal and water filtration questions which have been worrying the citizens of Toronto for a long time.

One of the chief obstacles in the way was the difference of opinion among medical and engineering experts. Both the Provincial Board of Health and the civic authorities are now satisfied that septic tanks in the vicinity of Greenwoods Ave. for sewage treatment and a filtration plant at the Island for water purification, will meet the requirements and the whole question will now be considered with that end in view. As one of the city's big problems, the agreement reached brings us nearer its solution, and all that remains to be done is to work out the details from the en-

gineering and sanitary standpoint and submit the by-law to the people for approval.

IS PLUMBING A PROFESSION?

A question which appears to be agitating the minds of the residents of one of our Western cities is whether a plumber is a professional man or simply a mechanic. Under the plumbing ordinance of the aforesaid city the Board of Health, a body of doctors, passes on the fitness of an applicant for a license through their control of the selection of a board of master plumbers to whom candidates for certificates must apply.

There are now on the town records ordinances empowering the Health Board to appoint the examining board and the Building Department to issue permits for all plumbing, to determine the kind of work and to appoint a board to examine applicants. Thus, two departments of the town government are in conflict as to who is the proper authority.

PREVENTING DAMP CELLARS.

Dampness is the chief enemy of mankind. Where there is dampness there is decay, where there is decay there is disease, where there is disease there is death. Eliminate dampness and fully one-half of the ills that flesh is heir to disappear. Those who have or are told that they have the germs of disease go to sections of the country where there is little or no rain and water is at a premium, while low lying, ill-drained, swampy regions are the abodes of fever, rheumatism and consumption.

Foul odors in houses that have been kept closed for a time are invariably due to dampness. The odor is not dampness, but the evidence of dampness, and the most common place for a dampness to accumulate is in cellars and basements. To be damp, it does not follow that water must collect in sufficient quantity to form pools and small streams in those parts of the building constructed below the surface of the ground. Moisture is continually coming through and the warmth of the rooms above creates a draft that draws the cellar air—impregnated with odors—up into the house, producing that damp, unaired smell that is not only very unpleasant but injurious to the health of the occupants of the building.

One often hears that "good drainage" is the one thing needful, but while good

natural and artificial drainage are by no means to be despised, indeed, they are essential to the welfare of human beings, they do not counteract the natural tendency of moisture that is in the ground, even in what is called "dry" ground, to find its way into openings whether they be cellars, basements, caves, mines or mausoleums.

Much thought and careful study and experimentation have been given to the subject of excluding dampness, from the antediluvian time when the patriarch Noah pitched the ark within and without to the present day, and many methods have been placed on the market. Some of them have merit, while others do not stand investigation, either theoretically or practically.

Acting on the principle that an ounce of prevention is worth a pound of cure, the time to dampproof a building is while it is being erected, says G. W. Kirwan in a recent issue of *Waterproofing*. There is nothing difficult or complicated about using a good material to exclude moisture from buildings. It is contrary to reason to apply any kind of preparation to the inside of a cellar wall and expect the house to be dry. The moisture will still be in the walls, and if the dampproofing preparation is able to keep it from coming through vertically it will travel horizontally, rising directly into the first floor, so that the last state of the house will be worse than the first.

The preparation should be applied on the footings as soon as they have been completed and the walls built on top of it; this prevents moisture rising by capillary attraction. After the walls are built and have become dry the preparation should be applied on the outside surface and carried well above the grade level, special attention being paid to having a good bond between that which has been applied over the footings and on the walls. Then the space between the walls and excavation should be filled in with earth, care and precautions being taken not to injure the dampproofing material. On the cellar floors the dampproofing should be applied between two layers of concrete, the same care being taken to unite the floor damp course with that over the footings, as with that on the outside wall. It is, of course, important to see that the concrete immediately on top of the damp course on the floor does not puncture the latter; if there are holes in the waterproofing it is certain that moisture will find its way through. Therefore, a safety coat of cement mortar should always be used on

top of the damp course, and the concrete upon which the waterproofing is placed should be tamped down as smooth as possible.

If the dampproofing be carried out in the above manner it will be seen that the basement has been converted into a waterproof pan, and an absolutely dry cellar will be obtained. This scheme will be found of great practical value for builders and house owners generally, especially in the suburban and rural districts, where houses are often so located as to have damp cellars.

FOUNDRYMEN'S CONVENTION.

A meeting was recently held to make preliminary arrangements for the convention of the American Foundrymen's Association, which is to be held in Toronto during the second week of June. The meeting was called by L. L. Anthes, vice-president of the American Foundrymen's Association, and the different organizations and bodies interested in this convention were represented. The exhibits will probably be made at the Toronto Exhibition grounds, \$12,000 being spent by the association last year in the mere placing and arranging of the exhibits, and altogether over \$40,000 was spent by the exhibitors and the association.

Canadian foundrymen should take advantage of this opportunity to make themselves familiar with the recent advances in foundrymen's machinery and supplies, and in the advances in the methods of manufacture, as will be brought out in the papers presented at the convention, and by the large exhibits. Affiliated with the American Foundrymen's Association are the Brass Founders' Association, and the Associated Foundry Foremen's Association. The Brass Manufacturers' Association has expressed a desire to visit Toronto at the time of the convention.

Any suggestions from any of the foundrymen or foundry foremen throughout Canada which might be of help to the committee, which is now being drawn up, in making arrangements for the convention in June, will be very much appreciated by this committee, of which L. L. Anthes, of the Toronto Foundry Co., will be chairman.

The secretary of the American Foundrymen's Association estimates that if the Canadian foundrymen turn out as is to be expected, there will be fully 2,000 at the convention.

Steam Heating in Practice

Article VI. Steam Heating of Churches—Written for this paper by W. B. MacKay, Toronto.

Churches are a class of building which do not adhere to any particular system of heating, in some warm air is used, some have systems of hot water heating while others again have systems of steam heating in various forms.

In churches, where hot water heating is used, some of the methods of securing even and effective distribution of the radiating surfaces are interesting.

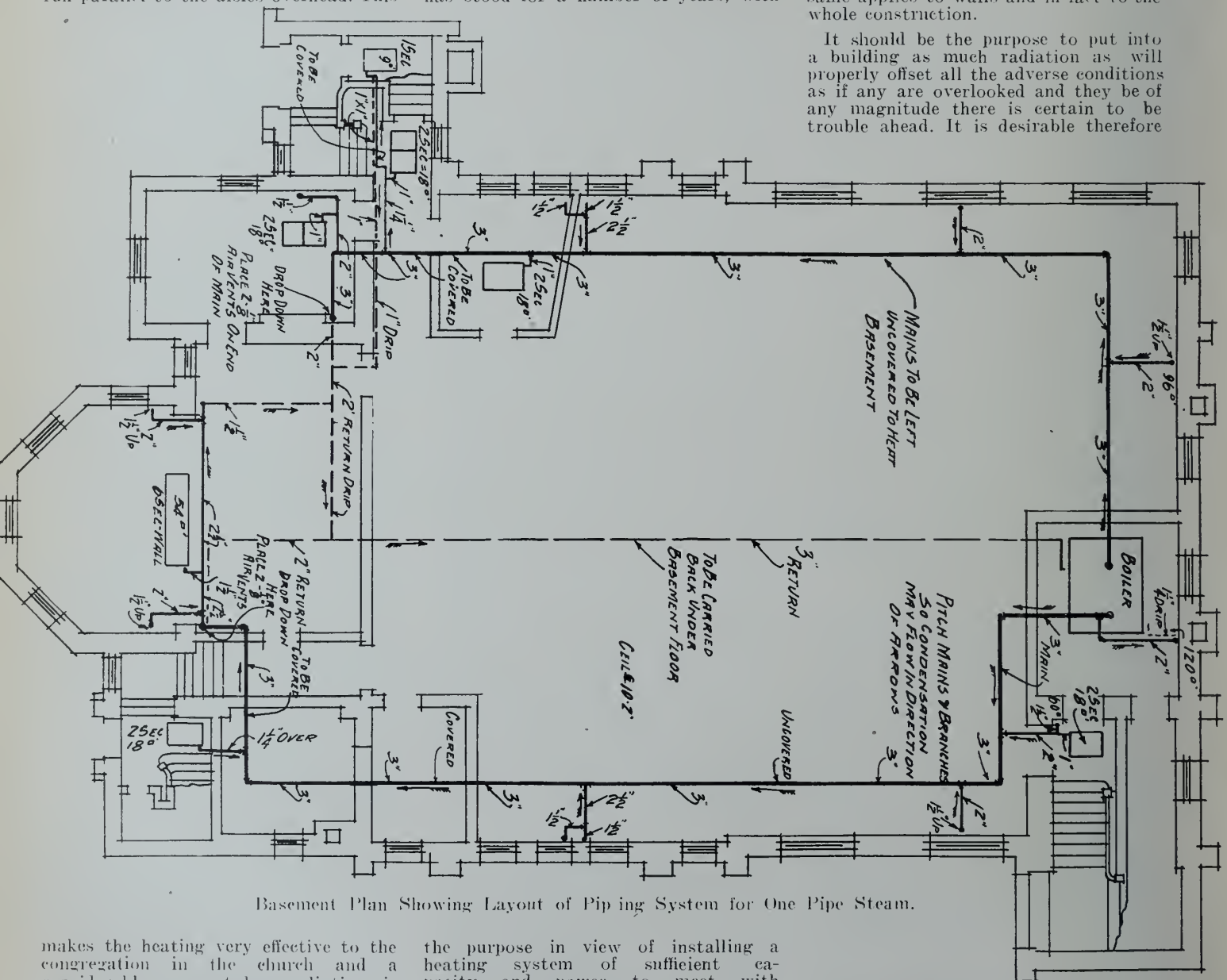
One in particular is the case of a large church where the heat for the auditorium is supplied from small coils of inch pipe under each seat and fed from the mains in the basement, which run parallel to the aisles overhead. This

The plans given herewith, are those of a church which is being used much after the manner of the average church, used Sundays and at intervals during the week. There is no gallery, the seating arrangement being all on one level. The glass surface is the usual leaded glass used in churches. The body of the church is open to the roof, the rafters being exposed, while the construction is of brick, etc. In general, it would be said that the building was in good condition to receive a heating apparatus.

When overlooking any building that has stood for a number of years, with

not more than normal. See that the casings have been properly set and particularly in the case of this church, with its roof ceiling it would be wisdom to find just what condition the roof is in, as the leakage through the roof can become a considerable factor in the calculation. It needs no great stretch of imagination to understand that due to the varied weather conditions, roof construction depreciates year after year and finally leaks rain, warps the sheathing underneath, giving rise to cracks, etc. These are what heating men must guard against and make ample allowance for in their calculations. The same applies to walls and in fact to the whole construction.

It should be the purpose to put into a building as much radiation as will properly offset all the adverse conditions as if any are overlooked and they be of any magnitude there is certain to be trouble ahead. It is desirable therefore



it is necessary to proceed as outlined in the last article, by using the glass surface, exposed wall surface, and cubic contents. To the actual exposed wall surface the total area of the roof was added in this case to make the proper allowance on account of the construction of the church, the roof acting as the ceiling. Again, it was found necessary to add to the amount of radiation to make allowance for intermittent heating. This was considered in one of the

Losses by Intermittent Heating.

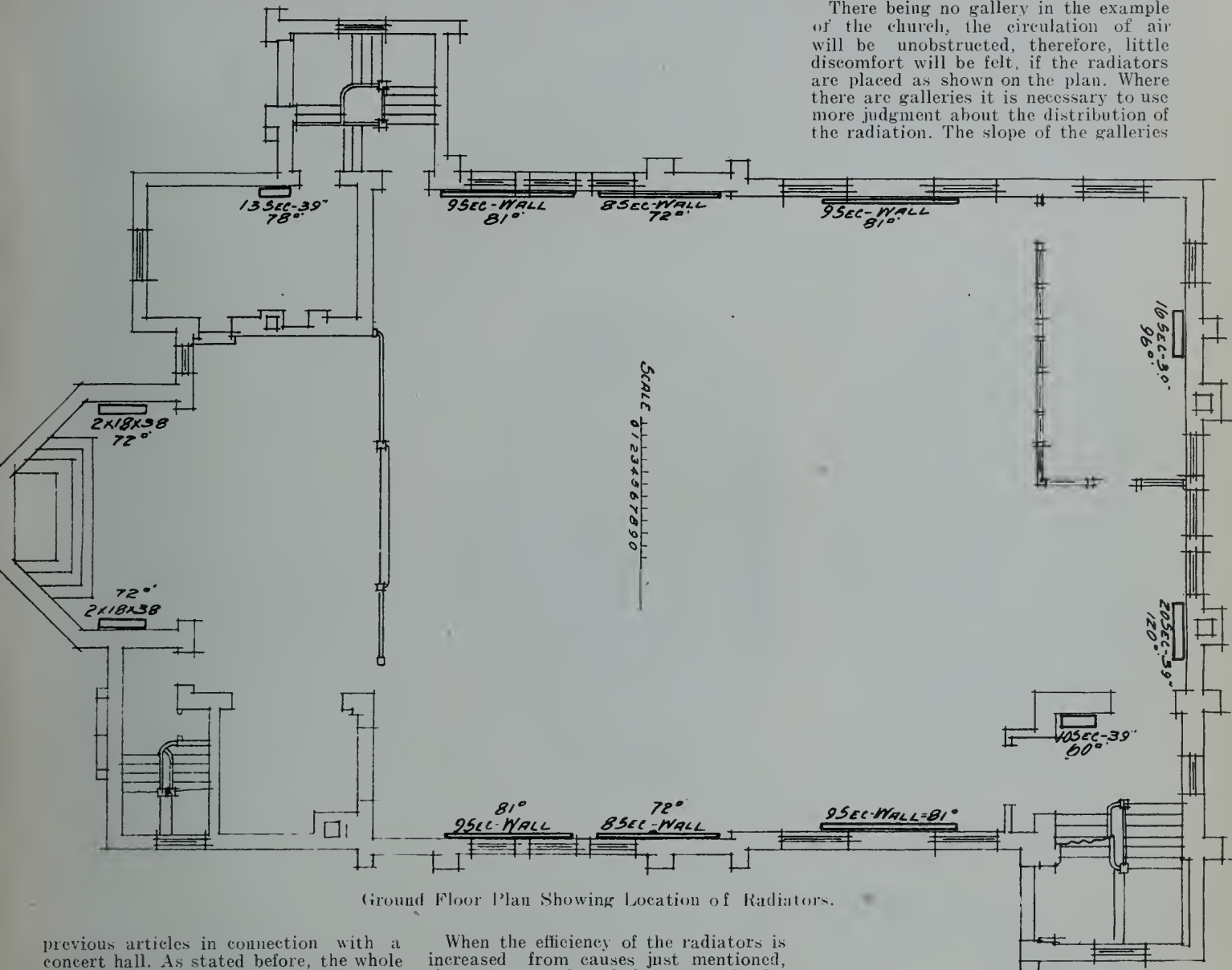
Radiators also become more efficient heaters and condense a greater amount of steam when the temperature in the room drops appreciably. The greater the difference between the temperature of the heating surfaces of the radiator and the temperature of the air surrounding the radiator, the greater will be the amount of heat radiated from one to the other.

cases that very little heat will be required when it is filled.

It is estimated that in an audience person is the equivalent of one square foot of radiation as regards the amount of heat given off, so that in heating a church the essential point is to have radiation enough, ample boiler power, etc., to raise heat in the building reasonably quick, to provide for the people coming in from the cold.

Galleries Obstruct Circulation.

There being no gallery in the example of the church, the circulation of air will be unobstructed, therefore, little discomfort will be felt, if the radiators are placed as shown on the plan. Where there are galleries it is necessary to use more judgment about the distribution of the radiation. The slope of the galleries



Ground Floor Plan Showing Location of Radiators.

previous articles in connection with a concert hall. As stated before, the whole of the cubic contents of the building becomes chilled when left unheated for any prolonged period.

The percentage of radiation added regulates just with what degree of rapidity a building may be heated up to a proper temperature after being left unheated for any period of time. In ordinary heating plants which are operated continuously, the radiation only supplies the loss of heat from walls, windows, air leakage, etc., and is not employed in heating up the furniture or any material in the room. These, when once when raised to the proper temperature, retain the heat, provided of course, that the heating apparatus is operated continuously and the temperature inside remains practically constant.

When the efficiency of the radiators is increased from causes just mentioned, the tax upon the whole system is increased also, so that it will be seen that the general design of a steam heating apparatus, or any other kind of heating apparatus for this class of building under such conditions should have liberal boiler capacity, ample sized mains, and everything in proper proportion. It must be remembered that once such a building is heated properly and continued for any length of time, the tendency will be to overheat the building on account of the extra capacity of the heating apparatus. This tendency is very greatly increased in the case of a church or any building used after the same manner, where there is heat given off by the occupants of the building. In fact, if a building, such as a church or theatre be well heated on the arrival of the audience it will be found in many

forms a pocket for the air and so prevents a free circulation. This then takes the form of a room with a low ceiling and care must be taken not to place too great an amount of radiation in spaces like these because it will become excessively warm, while the open parts of the church remain considerably cooler. If windows are opened uncomfortable drafts are felt.

It is necessary to place the major portion of the radiation in the open on the exposed sides also to protect all entrance doors to prevent currents of cold air from passing directly over the heads of the audience. Then again the point is brought out with respect to high ceilings. It will be found necessary to add

to the radiation of any building for an extra high ceiling, to maintain a comfortable temperature at the breathing line, which is usually taken at 5 ft. from the floor.

Rooms of 14 feet require about 3 per cent. more radiation, those of 20 ft. require about 8 per cent. more radiation, while those of 25 feet require as much as 15 per cent. more radiation than a room the ceiling of which is only ten feet in height.

The Ventilation Problem.

Some churches have systems of steam heating which provide for ventilating as well as heating the auditorium and it will be the endeavor in future articles to bring out some of the important points of these modern systems of steam heating and ventilation in use in some churches at the present time.

As regards the piping system used in connection with the example, little

comment is necessary, as it is similar to the preceding cases.

The style of air vents used should be of the most reliable type, for the reason that the requirements for steam will vary according to the requirements of the church, oftener than in the case of a steadily operated systems. The proper venting of the air from the system is of vital importance and in church heating it is necessary to have the operation as near perfect and automatic as possible to prevent extra labor and loss of time as well as to prevent undue hammering, etc.

Valves for turning off steam leading to the radiator (usually placed at the last connection of the branch to the radiator) may be placed underneath with equally good results, and will be more convenient for the janitor to turn off the steam without entering any of the various rooms.

Lavatory Supply Fittings

The Engineering Review Outlines the Utility of the Various Fixtures for Drawing Water.

In order to secure a uniform water supply to all fixtures, it is essential that the various parts of the water supply system be properly proportioned.

It is especially important that those fixtures which are used frequently should have an ample supply of water at all times. Small piping is the cause not only of the annoying hissing or singing in the pipes often heard, but also of one faucet being robbed of water by another more favored in location.

The principal factor to be considered in proportioning a water supply system is the number of fixtures from which water is drawn simultaneously. In buildings containing a limited number of fixtures, especially residences, it is the custom to proportion the supply pipes so that all fixtures may be equally served. Such provision, however, is unnecessary in larger buildings, like hotels and apartment houses.

Further consideration of the subject shows that, as a rule, only one fixture will be used in the bathroom at a time. This is true also of the kitchen. On the other hand, the simultaneous use of the bathroom and kitchen fixtures is quite common. In practice, therefore, it has

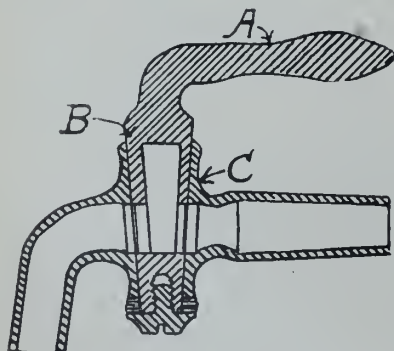


Fig. 1.—Ground Key Cock.

been found that sufficiently large pipes will be obtained, if the system is so proportioned that one fixture in each group is supplied simultaneously.

The maximum size pipe employed to supply any fixture is $\frac{3}{4}$ -inch diameter, $\frac{1}{2}$ -inch diameter being the average size.

The types of basin cocks or faucets in most common use at the present time are shown in the accompanying illustrations.

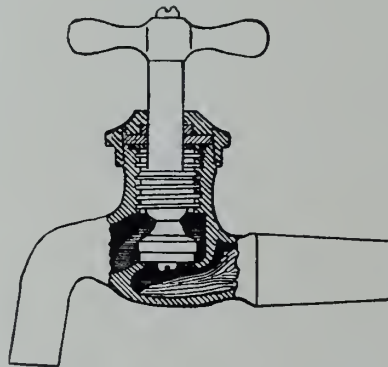


Fig. 2.—Compression Faucet.

Fig. 1 is a sectional view of a ground key cock, which is also often used as a stop cock for controlling water in a pipe. The plug B is inserted in the cock C and ground to a water tight fit. The cock is operated by a quarter turn of the lever A.

The continual wearing of the plug and cock, whenever water is turned on or off, thus causing the cock to leak, is one of the great objections to this type. This objection is further emphasized by the fact that the leak can be remedied only by regrinding the plug, an expensive and tedious operation.

There is also another objection to this type of cock, arising from the quickness with which it shuts off the water, which is apt to injure pipes and fixtures, where the water pressure is high.

These cocks are made for both lead and iron pipe. When made for iron pipe the cocks are either tapped with female threads or threaded to screw in a fitting.

The type of faucet known as compression work is shown in Fig. 2. While the use of this style of faucet is sometimes accompanied with the whistling and singing noise above referred to, it is generally preferable for lavatory work to the ground key cock. Its construction

is similar to a globe valve, and its similarity is further emphasized by the fact that, like the globe valve, it closes against pressure. A soft disk packing is provided in the core of the compression cock, which is easily renewable in case of leakage. For the purpose of preventing the emission of water around the compression stem, the cock is provided with a rubber packing, or a ground joint. Where varying pressures, especial-

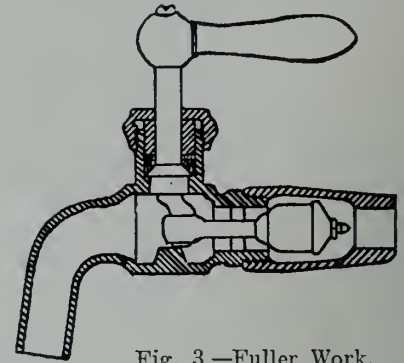


Fig. 3.—Fuller Work.

ly very high ones, are used, the compression pattern is found to be better adapted and more suitable for the work.

Fuller pattern faucets, a type of which is shown in Fig. 3, are almost entirely used in high grade lavatory work, where low pressures are employed. This style of faucet closes quickly with the pressure, the seal being effected by means of a rubber packing. In installing this fixture provision is, customarily, made for an air chamber connected with each supply pipe, because of the quickness with which this type of cock can be closed.

The popularity of the self-closing faucet, a type of which is shown in Fig. 4, has been brought about through the desire to eliminate, as far as possible, the waste of water. There is the added advantage also in the use of such faucets, that water cannot be left running, thus guarding against the overflowing of wash basins. As shown, the faucet is provided with a spring, the pressure of which keeps the valve on its seat when not in use. In order to obtain water the handle of the faucet must be held open continuously by the hand, otherwise the

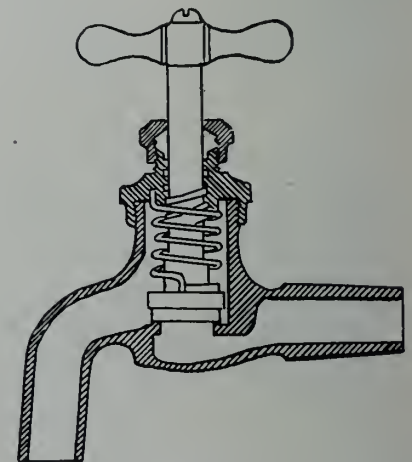


Fig. 4.—Self-Closing Faucet.

spring will close the valve seat, thus shutting off the flow of water.

Because of the liability of water hammer, caused by the sudden shutting off of the water, this pattern of faucet is not recommended for use where the water pressure exceeds 100 pounds.

Making and Recording Estimates

The Advantages of Using More Care and Accuracy Emphasized by Arthur W. Massy, An Architect.

Assuming that as a class contractors are thoroughly practical experts, let us consider what supplementary assistance consisting of books, etc., is at their command, as an adjunct to their practical knowledge and experience, which will help and guide them in making a complete and safe estimate of each and every item of material and labor.

First, there are excellent and valuable books in the market on the subject of estimating, written by men of acknowledged ability and experience. These works treat upon all the various materials required in the construction of a building, from the foundation to the finals on the roof. They teach how to compute the quantity of material required in any one item of work, and also how many hours or days of labor will be required to complete that one item. The price of materials and labor is purely a local matter.

Second, there are also a great many valuable technical books, trade journals, etc., published, treating upon the principles of mechanical construction work, etc. From these they obtain very valuable information upon the various problems of general building construction, assisting them in performing many of the intricate and difficult mechanical operations connected with modern buildings (which are continually coming up to perplex the expert contractor), in the most economical, expeditious and successful manner. Especially is this true of the various trade journals, for they certainly lend the contractors far more real and valuable assistance than can come from any other source, because they bring them in constant touch with most approved, up-to-date and practical methods, data, etc., together with an exchange of appreciated new ideas, new experiences, in meeting practical building problems, from men in other fields of building activities, where the market conditions of materials and labor are different.

Third, in addition to those publications, there are thousands of valuable labor-saving catalogues, issued by the various manufacturing establishments throughout the country, which can be obtained gratis for the mere application for a copy. Many of these catalogues are really works of art; some contain additional technical information, tables, etc., which are useful to the contractors, and nearly all contain some fine descriptive illustrations and styles, patterns, with a price, and a catalogue number accompanying each article or class. These are intended to assist buyers in ordering goods, and in getting estimates on such materials as may be required, and also to prevent mistakes and confusion which might occur in a long written description of the ordered goods. And also by the use of those numbers, and telegraphic codes they are saved hours of tedious labor in writing long descriptive letters of articles wanted.

Some of the above class of publications, and many more besides, may be found in the office of every contractor.

With this valuable data always at hand to help and guide them in making

an estimate, for saving so much of their time, and supplemented by the personal practical experience of the contractors, it would seem that it would be almost impossible for an experienced contractor to make a mistake on the wrong side of a contract, or at least a serious one.

It is a well known fact among architects and builders from Maine to California that where several contractors are estimating on the same work, from the same plans and specifications, and under the same local conditions, no two estimates are alike. Again take the same parties estimating on another job and under similar conditions, those who were too high in one case will be too low in another, and vice versa.

This clearly proves that the discrepancies and differences between estimates

These items often amount to considerable, during the course of the construction of a building, and need careful consideration like other matters of cost.

MUELLER TRAVELERS' SCHOOL.

The traveling salesmen of the H. Mueller Mfg. Co. on January 11th, concluded their annual school of instruction which lasted two weeks, in the home office in Decatur, Ill. Among other things to engage their attention was the new nine-hundred-page catalogue D, of water, gas and plumbing goods, now being sent out to the trade. The work on this very complete book was finished a few days before Christmas and its delivery to the salesmen, who had anxiously anticipated it for a year, was greeted with applause. During the school of instruction the catalogue was carefully reviewed and the goods discussed to bring out the best points. These schools of instruction have been prolific of good to the salesmen in the past, but the one just closed was voted by all as the most



W. C. HEINRICKS,

Representing the H. Mueller Mfg. Co. in Western Canada.



GEO. A. CALDWELL,

Representing the H. Mueller Mfg. Co. in Eastern Canada.

by the same contractor, are not due to mere casual mistakes, which may occur to anyone, or to inexperience or incompetency, because they may and do occur among the more intelligent, as well as among the less informed contractors. But it most certainly does prove that carelessness is more responsible for failures than anything else, because they do not give themselves sufficient time to calculate all of the individual items of materials, labor, cartage, etc., and their cost. Consequently they resort to clustering a number of items together under one head, allowing so much for possible materials, and so much for possible labor, and which is they trust too much to memory, resulting in repeating or omitting many important items, because they become confused and uncertain as to whether they had, or had not calculated them. Another item which often escapes their memory is cartage, which includes freight, etc.

profitable. The sessions of the school were held daily from 9 to 12, and from 1.30 to 5.30, the president of the company presiding and all members of the company being present.

Jean Paquette, founder of the firm of Maison Jean Paquette, plumbers' supplies, Montreal, is dead at the age of 70 years. Mr. Paquette for many years took a leading part in the building of Montreal and district, among the works associated with his name being the construction of St. Jean Baptiste Church, the Convent of St. Genevieve, and Terrebonne College. About twenty-five years ago, Mr. Paquette started a hardware business, and followed this up by going extensively into plumbing supplies. Two of his sons, Odessa and Charles Paquette, are members of the big concern that has grown up since that day.

Evolution of House Ventilation

The Second Article by E. D. Sidman in Building Management.

The introduction of the hot air furnace created a new epoch in heating, as it concentrated the heat for the entire building into one fire pot, doing away with small fires scattered through the building in stoves, etc., confining all the coal, ashes and dirt entailed by them to the basement or cellar, and this one point should do much to pardon the faults connected with a furnace.

Credit should also be given the furnace makers for being the pioneers toward modern ventilation, as from their first crude efforts and principles developed by them the present comprehensive system of ventilation sprang. But it is a sad thing to say that, despite the labor, thought and effort expended upon it, the hot air furnace of to-day comes no nearer perfect heat and ventilation (except in rare instances where it is combined with other systems) than it did when first invented, and from a building manager's standpoint the only thing that recommends it is its low first cost.

Objection to Furnaces.

The main objection to the hot air furnace by managers and owners was the old danger from fire, and improved construction has practically eliminated that; but the objection to them from the standpoint of these articles is their unhealthiness as usually erected and operated. To fully understand this the construction and operation must be explained. The fire pot or heating chamber is usually made of cast iron, with the necessary grates, ash pan, etc., varied in many ways by different makers, all with the laudable idea of economy in fuel. This fire pot is surrounded with a jacket or outside covering, leaving a space between it and the fire pot through which the air passes from an opening in or near the bottom, upward around the fire pot, where it is heated, out through openings in the top of the jacket into pipes or conduits, thence to the registers in the rooms. The original idea, which has been tried time and again with none or only partial success, was to bring the air from the outside of the house direct to the furnace, warm it and send it as pure as possible direct to the rooms, which, while very nice in theory, in practice was found in most instances to work against the law of nature and thus become an impossibility. Why? Because when air is heated it becomes lighter; also the wind will change at times and instead of blowing toward the intake will blow away from it, and change the air currents so that at times the cold air would enter the registers and the hot air pass out of the intake, but the main reason was, and is, that in but rare instances are there properly constructed exhaust vents in our buildings, to carry off the dead foul air, and as there is no fan or other pressure device, the warm air being so much lighter cannot of itself displace the heavier foul cold air and create circulation. The manufacturers, to overcome this, connected the intake to a proper sized register face set in floor of the hall or some cool place, in some cases using an auxiliary intake from outdoors, and by this means they cre-

ate circulation, but in no case ventilation, as is claimed by many.

Our objections to the hot air furnace based on the grounds mentioned are: First, the dust which accumulates around and in the register pipes, and is forced out into the room by the rising of air currents, for us to breathe over and over and to cover everything in the room; second, the air in passing over the hot plates of the fire pot is baked to an extent that nearly extracts all the humidity from it, and destroys the vitality of the air.

It is this last cause, my neighbor, that causes your furniture to "squeak" and go to pieces, and you that sleep without proper ventilation to get up in the morning with that tired feeling, and dark brown taste in your mouth, spoiling your appetite for breakfast to an extent that nothing is right or tastes good, and makes your wife declare that you are "crosser than a bear," though probably if she were to tell the whole truth there was no difference between your feelings. This is also the reason you will hug a register and swear the house is cold when the thermometer shows 72 degrees, while in the spring you will take off your coat and chase around outdoors in your shirt sleeves when the thermometer only registers 65 degrees. Haven't you noticed it?

Efficiency of Water Pans.

Do not think there has not been any effort made to overcome this, for there has, and many times, and the result of this effort has been that nearly all furnaces to-day are equipped with what is known as a "water pan" in it somewhere, and when used properly they all do more or less good; but the trouble is that they are oftener neglected than taken care of, as they are so made as to call for manual attention, and the writer has never seen but one that would hold the humidity through the house to 65 degrees the normal, and that was an independent machine and could be attached to any furnace.

The writer, to determine the efficiency of these various water pans, made 168 hygrodick tests during the winter of 1905-6 and in only three of these was the relative humidity above 60 degrees, while the average for the whole was below 40 degrees. A carbacidometer test made at the same time showed varying amounts of carbon dioxide in all but seven places, three where the humidity was normal, and four in a set of flats having the modern system of natural ventilation. In view of the above, is it any wonder that we cough, hack and are so stuffed up mornings that it takes a brisk walk or a long, cold ride to get us cleaned out and ready for the business of the day?

It will be our pleasure later on in these articles to point out to the manager, owner and tenant how in nearly all cases where they are warmed by hot air furnaces (and there is no question of the ability of a proper sized furnace without too long cellar pipes heating most any ordinary house or flat as warm as desired), they can reduce dust about 75 per cent., get perfect ventilation, the proper amount of humidity,

save in fuel, increase the health and cleanliness, and all at a small money expense, a little care and trouble.

Hot Water and Steam Heating.

Hot water and low pressure steam heating, although not in use as long as the furnace, are gradually crowding them and stoves out of residences and small buildings, as they have in office buildings, and probably in the near future, when the automatic vacuum steam systems are better known and appreciated, it will become the almost universal heat.

While both hot water and steam are superior to a furnace as a means of heat, inasmuch that they eliminate the dust and are not a source of carbon dioxide, they are scarcely any better as regards drying up the air, and unless the building is properly ventilated, will not warm it as quick or any better than a furnace, and in fact, as erected and operated in many buildings, are a nuisance, a cause of much trouble and many colds, instead of a source of health and comfort as they should and would be if the subject of ventilation was understood and enforced by the managers and owners of the buildings.

Many people go to the extra expense of installing hot water systems with the idea that they are more economical in fuel and that they will furnish more moisture to the room than low pressure steam; while repeated tests with a hygrodick show that hot water heat furnishes only a degree or so more humidity than a hot air furnace, and no more than low pressure steam; in fact, as commonly erected, with compression or poor automatic air valves, which allow a small leak of steam in the room, the steam heat shows several degrees more relative humidity than hot water. Of course where the above conditions exist, it shows an imperfect job, and while it raises the humidity, it is an unnecessary drag on the coal pile. While it may be a little out of place in these articles, it may be interesting and perhaps instructive to some to know the relative economy in fuel of the various systems of heating residences and buildings (not offices or buildings heated from power or central plants), compiled from tests made by various heating engineers. Using 100 as a basis, they run about as follows: Automatic vacuum steam, 100 per cent.; hot water (mild weather), 85 per cent.; low pressure steam, 75 per cent.; hot water (severe weather), 70 per cent.; hot air furnace, 60 per cent.; stoves, 45 per cent.

We shall endeavor to show later on how by ventilation, and some few changes, most any hot water or low pressure steam system now in use can be made to give satisfaction to the tenants, and be made a more healthy and economical source of heat.

W. P. Miller, of Brockville, and his son, R. F. Miller, Edmonton, have purchased the hardware business of McFarlane & Northcott, Calgary. The firm changed hands this week and the name was changed to the W. P. Miller Hardware and Heating Company. The new firm will add heating and plumbing to its present business. W. P. Miller was formerly manager of the James Stuart Manufacturing Co., Limited, Brockville. Catalogues from eastern manufacturers and jobbers are solicited.

Coal Consumption in House Heating

William H. Bryan, St. Louis, Discusses the Subject in An Instructive Manner in the Metal Worker.

I have collected some data on the subject of coal required in house heating, some of the results being published in a paper contained in the Transactions of the American Society of Heating and Ventilating Engineers, Volume VIII. Some further figures in this same direction I collected for publication in the World's Fair Bulletin of the Engineers' Club of St. Louis, which is as follows:

Heating By Steam.

Col. E. Meier gives the following figures covering three first-class buildings of average location and exposure:

January, 220 tons; December, 286 tons; total, 1,122 tons. This building has very thick walls, the proportion of glass to wall surface is small, and its exposures are favorable.

The writer (Trans. Am. Soc. Heating and Ventilating Engineers, Vol. VIII.), estimates the average consumption of fuel for heating an ordinary building in St. Louis at 1 lb. common coal per season per cubic foot of space heated, for either steam or water. This figure is, of course, affected by the character of the building, its size, exposure and the system of heating employed. Large buildings, and those heated by hot water,

Building	Cubical contents	Pounds coal per hour per 1,000 cu. ft. contents.	Pounds coal per hour per 1,000 sq. ft. exposure.	*Tons per 1,000 cu. ft. year per
A	750,000	0.310	6.30	0.56
B	650,000	0.423	9.49	0.76
C	3,228,000	0.317	10.24	0.57

* Computed on an assumed service of 3,600 hr. annually. The ton used herein is always the short ton of 2,000 lb.

A. C. Edgar (Heating and Ventilation, July, 1900) computes the average amount of coal required per season in St. Louis, per square foot of steam radiating surface, as 39.17 lb. This is based on average temperature on coal delivering 10,000 B.T.U. per pound, and an output of 284 B.T.U. per square foot of surface per hour. As our common Illinois coals will deliver only about 6,667 B.T.U. per pound, this figure should be about 60 lb. instead of 39.17.

The Board of Education Building, St. Louis, consumed for heating alone, in 1896, 750 tons of common coal, and in 1897, 800 tons. Its contents being about 2,000,000 cu. ft., the consumption per 1,000 cu. ft. per season is approximately 0.40 tons. This was distributed throughout the year as follows: January, 158 tons; February, 139 tons; March, 116 tons; April, 54 tons; May, 14 tons; October, 51 tons; November, 92 tons; December, 147 tons; total, 771 tons.

Heating by Hot Water.

Heating by hot water is usually a little more economical in fuel than steam heat. Mr. Edgar estimates the good coal burned in St. Louis per season at 24.83 lb. per square foot of hot water radiating surface of an output of 180 B.T.U. per hour per square foot. Increased for our inferior fuel, this should be about 37 lb.

The St. Louis Custom House, burned in 1898, separately for its hot water heating system, 1,122 tons of common coal. The contents of this building being about 4,342,000 cu. ft., the consumption was 0.26 tons per 1,000 cu. ft. per season. This was distributed throughout the year as follows: January, 231 tons; February, 190 tons; March, 87 tons; April, 60 tons; October, 48 tons; No-

a number of representative St. Louis buildings is as follows:

Buildings	Contents Cubic feet	Tons coal per year	Per 1,000 Total cu.ft.
Ferguson-McKinney	3,340,000	2,383	0.72
Haragadine-McKittrick	2,507,000	2,303	0.92
Custom House:			
New plant	4,242,000	3,388	0.78
Old plant	4,242,000	4,791	1.23
Chemical *	1,210,000	2,100	1.73
Missouri Trust *	1,630,000	3,065	1.88
Mercantile Club	846,000	2,503	2.96
Columbia *	195,000	585	4.40

* Office buildings.

AMOUNT OF AIR SUPPLY.

The amount of air to supply has bothered many of the younger furnace men. One reliable way of arriving at the amount is to figure the area of the different hot air outlets and provide a cold air supply area of equal amount to their total. Some provide an area of two-thirds of this amount, which is sufficient when the thermometer is near zero. Others provide three-quarters which is better adapted to the milder weather and still others provide a supply area equal to the entire hot air area. And this is best. It is a simple matter to use dampers to cut down the supply, but if the supply is two-thirds or three-quarters it is impossible to increase it in the spring and fall months, when the furnace must be run and the supply is at so high a temperature that even a moderate fire is liable to over-heat the building.

THE ELECTRIC MOTOR IN THE BRASS FOUNDRY.

In most brass foundries little power is required to operate machinery, and can generally be most favorably supplied by electric motors. Recently in an east Boston foundry a 5 h.p. motor was installed to take the place of a steam boiler and engine, which had given trouble in previous cold seasons, and which had to be run with the fires banked a considerable part of the time at poor efficiency. The motor was installed on an overhead platform, which released valuable floor space for other uses, and was employed to drive a washer designed for separating copper and other metals from the molding sand. Another brass foundry installed a 5 h.p. inclosed motor to drive a blower supplying air to four crucible furnaces and a reverberatory furnace for melting babbit, a sprue cutter, magnetic separator, tumbling barrel and two emery wheels. In a street railroad brass foundry, where crude oil was burned in the melting furnaces, a 2 h.p. motor was used to operate the air compressor, and a second small motor connected to the oil pump. The cleanliness, economy and flexibility of the electric drive justify its application to small installations of this character no less than in the heavier fields of general foundry and machine shop practice.

NEWS OF THE TRADE IN CANADA

W. W. Rockwell has opened a plumbing and steamfitting business at Kentville, Ont.

Armstrong Bros., Kingston, have established a plumbing and steamfitting business at Midland.

C. A. MacKay, plumber and steamfitter, Haileybury, Ont., was a recent visitor in Toronto.

Thompson & O'Connell, have started a plumbing shop on the corner of Sussex and Major Streets, Toronto.

W. Griffiths, of Griffiths & Adamson, master plumbers, Toronto, has returned from a trip to California and British Columbia.

Another new water pump will be purchased by Winnipeg, which will add about 2,500,000 gallons daily to the capacity of the service.

Mr. Honeywell, Wabash, Ind., president of the Honeywell Heating Specialty Co., visited Toronto and Montreal last week, calling on the heating supply men.

The John Ritchie Plumbing & Heating Company, 64 and 66 Adelaide St. East, Toronto, are to move to new quarters at 56 Adelaide East, next month.

Paul Smith, formerly on the sales staff of Cluff Bros., Toronto, is now re-

Toronto, states that the factory is one of the best constructed west of Toronto.

Weyburn, Sask., is installing a municipal water supply system. A large supply of splendid water will be brought from an impounding reservoir to a standpipe in the town, from which it will be distributed by gravity. Willis Chapman, of Toronto, is engineer.

The Taylor-Forbes Company, Guelph, recently presented their customers and friends with a calendar showing a number of "Sovereign" boilers manufactured by them. The calendar will be mailed on request to anyone in the heating trade.

R. W. Harrison is closing up his plumbing shop at 389 Spadina Ave., Toronto, the old home of the firm of Harrison & Robertson. Rumor associates "Bob's" name with an important position on the staff of one of the supply houses of Toronto.

A. J. Hammond, of Rodway & Hammond, Winnipeg, and ex-president of the National M.P.A., has been visiting Vancouver on his way down to California on a holiday trip. Business at Winnipeg has fallen off and last year was not a profitable one for the trade.

The agitation to have a plumbing inspector appointed in Hamilton has been revived, but the prospects for the appointment of such an official are not very rosy. The board of health is heartily in accord with the proposal and the trade and labor council is also boosting the project, but the aldermen cannot see their way clear to grant their request.

A. J. C. Weeks, of Weeks & Co., master plumbers, Vancouver, and vice-president for B.C. in the National M.P.A., is spending a month's holidays in Toronto and when he goes West again his railway fare will be double that of his trip East. A preacher may claim to make two persons one but the railways don't accept the parson's say-so. Twenty years ago Weeks & Co. were a well-known plumbing firm in Parkdale.

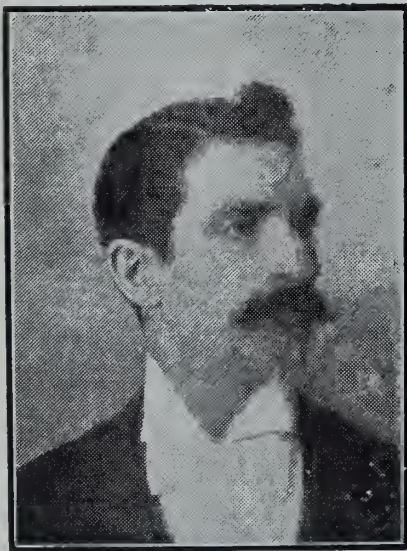
W. J. McGuire & Co., master plumbers, Toronto, have won a suit against the Cobban Manf. Co., of the same place. The defendants refused to pay the final instalment amounting to \$690 with interest, due on a system of automatic sprinklers installed by W. J. McGuire in 1906, claiming that a plumbers' combine existed. On the evidence, Justice Falconbridge ordered the jury to bring in a verdict for \$600 on the ground that no valid defence had been made.

Electric wiring and fitting for plumbers and gasfitters is the title of a recent addition to our technical library. The book was compiled by Sydney F. Walker and in simple language makes many technical points clear. The author deals with his subject from the standpoint of a practical man and the book is addressed to plumbers and gasfitters, who in the opinion of the author, will replace the electrician in the near future in the work done in the wiring of new buildings. The book should prove a help to all interested in electricity and all its branches. The price of the book is 5s. 6d. Address The Technical Book Department, MacLean Publishing Co., Toronto.

The board of works of the Vancouver city council had considerable discussion over the efficiency of pipes for plumbing purposes, whether oiled pipes or tarred pipes gave the best results. Mr. Weeks, one of the plumbers, stated that one of the objections to oil pipes was that they had to be brought from across the line, as bringing them from Toronto meant a delay of three or four weeks. Eventually the decision reached was that no oil pipe should be used as a soil or waste pipe which shall weigh less than the following per foot: Two inches diameter, 4 lbs. per foot; 3 inches, 6 lbs.; 4 inches, 9 lbs.; 5 inches, 15 lbs.; 6 inches, 20 lbs. All soil pipes, waste pipes and fittings for interior work shall be coated with asphaltum or oiled, and for exposed work they shall be immersed in linseed or vegetable oil; all underground shall be coated inside and out with asphaltum.

WATER SUPPLY OF BLIND RIVER.

The Ontario Board of Health has approved of the new water supply and sewage disposal scheme for Blind River, Ont. The municipality will under this scheme take its water from the Blind River and empty its sewage into Lake Huron.



A. E. HAMILTON.

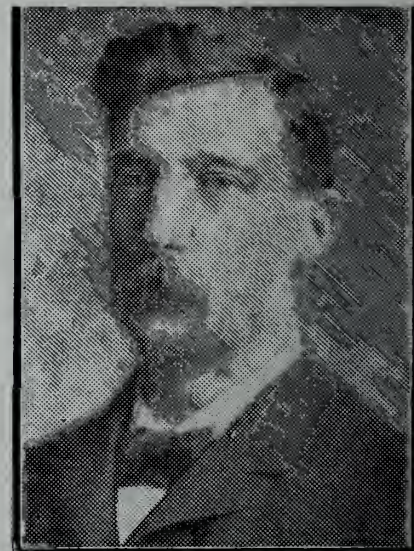
Of Hamilton & Stott, Master Plumbers, St. Thomas, Ont.

presenting the Ideal Manufacturing Co., Detroit and Windsor, between Windsor and Toronto.

Nott & Mallett, Vancouver, have about completed their \$85,000 job of installing plumbing, heating and lighting systems in the new Empress Hotel, erected by the C.P.R. at Victoria, B.C.

Building permits for January totalled \$351,685 in Vancouver, as against a total of \$187,265 for the same month last year. These figures are 20 per cent. in excess of any other month's showing in the history of the city.

The Wolverine Brass Factory, Chatham, has commenced operations with a complement of about 25 hands. Mr. Clark, Government Factory Inspector,



JAMES STOTT.

Of Hamilton & Stott, Master Plumbers, St. Thomas, Ont.

The proposed extension of the Guelph water system was also approved, but permission was refused the city of Niagara Falls to dispose of its garbage by throwing it into the Niagara River.

The new sewage scheme for Orillia was also approved of.

SITUATIONS VACANT.

WANTED—A traveler for Canada, to represent a large Canadian manufacturer; must have acquaintance with wholesale and retail plumbing trade, retail hardware and gas companies; only those who can absolutely fill the requirements need apply. Give references, age, married or single, salary expected. Address Box 684, PLUMBER AND STEAMFITTER, Toronto. (4)

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Feb. 24.—Trade generally is very bad, and everyone is looking forward to the time when, with the return of spring and the opening of navigation, plumbing and its allied industries will move along with leaps and bounds. Manufacturers are being held back somewhat by the supply houses, who have not yet commenced to place orders to the extent they have done in former years. There is still a hesitancy as to how matters will shape during the coming season, and this restricts the buying. It seems very probable, therefore, that when trade does open up, a congestion will be experienced that will cause serious inconvenience all the way round. Everyone will be wanting goods in a hurry, the factories will be tied up, and supplies will be hard to secure. The man who is wise will waste no time now in placing his orders.

Building prospects every day become brighter. Landlords who decided some time back to put off the construction of the flats, houses and building premises they had projected, have reconsidered the matter and are going to carry the work through. Architects are uniformly busy, and there is every reason to anticipate a good year for the plumbing trade. The shops just at present are not so busy as they were. Jobbing work has fallen off with the breaking of the cold weather, and contract work is naturally not heavy. The opening out of trade will not long be delayed, however, and the cry will then be that of too much work.

Soil Pipe—Soil pipe, after a slight rally, has become quiet again. Manufacturers are in good shape to meet the demand that is now close at hand. We quote 60 and 10 off new list.

Lead Pipe—Lead pipe is moving fairly well, but not to the extent it did during the very cold weather when repair orders were keeping plumbers at full pressure. We continue to quote lead pipe and waste at 20 per cent. off. Bends and traps are unchanged.

Solder—This article is somewhat stagnant again. Plumbers are now in full stock for the time being, thanks to the recent demand caused by the extra jobbing work, and have probably enough to last them until building operations start in again. We quote half and half 19c and wiping 18c for fair size orders.

Enamelware—There has been no great stimulation to the demand as yet, and conditions generally are dull. There is every indication that trade will be heavy when it does start.

Brass Goods—The call for brass goods is very dull, and even the cutting that has taken place in the inferior lines on the market has not stimulated trade. The better class articles still maintain their prices, and we quote standard compression at 57½ and 60, and fuller work 65 per cent. off list.

Radiators and Boilers—These lines are quiet. Stocks are strong, and every thing is in good shape for a busy season.

The price of hot water heaters has been changed, and the amended list can be obtained from the manufacturers.

Iron Pipe—There is little doing in this line at present. A few orders are being carried through, but until the building season opens a strong movement cannot be expected. A reduction has been made in prices, and we now quote \$5.28 for 1-inch black and \$6.93 for 1-inch galvanized.

Metals—The market's are not so steady as they were. Tin is higher owing to speculative movements and light stocks. Copper is weakening under a falling off in exports, and a stagnant domestic demand. We quote: Copper, 14½c; Tin, 32½c; lead \$4.50; pig iron, \$21.50 for Middlesboro, No. 2, \$20.50; Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, Feb. 26.—Trade conditions are on the mend, and from the present outlook a large amount of building is in prospect in all parts of the country. Booking in many lines for future delivery is improving and though still behind last year's record conditions generally are on the mend and prospects continue to brighten.

Since last writing several important revisions have been made which will effect orders for immediate and spring needs as dealers throughout the country have been expecting the new lists.

Iron Pipe—The easy condition of the pig iron market is responsible for an important reduction on all sizes of iron pipe. Stocks are in fairly good shape and as buying has been for immediate needs only in contemplation of the reduction a revival of business in this line will likely result from the revisions. We now quote: One-inch black at \$5.28 per 100 feet and 1-inch galvanized, \$6.93 per 100 feet.

Soil Pipe—The market at present is firm and the demand dull. Stocks are in good shape and a small booking business for spring delivery is beginning to come in. Prices remain as follows: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent. and fittings, 60 per cent.

Lead Pipe—The cold snap has stimulated the demand and since last writing small orders have been going out constantly for repair work. We still quote lead pipe and waste at 20 per cent. off list. Caulking lead remains at 5½ cents per pound. Traps and bends remain at 55 per cent. off list.

Solder—Solder is moving freely, but in small quantities, the demand being caused by the effect of the cold snap. Prices remain firm. We quote wiping solder at 18c and half and half at 19c.

Fittings—The recent reduction in iron pipe has not touched cast iron fittings. Stocks continue fairly plentiful and a revision of prices is expected in the near

future. Canadian malleable fittings have been reduced from 30 to 35 per cent.

Radiators and Boilers—The manufacturers have adopted new lists with a uniform discount, but with revised list prices, showing a heavy advance on the cut prices ruling last year. We now quote: 50 and 10 off list on boilers and on radiators, 55 on hot water, 55 and 2½ on steam, 50 and 5 on wall, and 40 on specials.

Brass Goods—Reductions long predicted has at last been made, and, as a result, booking has been encouraged. We now quote: Fuller work 70 per cent., standard compression work 65 per cent. off list.

Enamelware—There is a seasonable demand for these lines, with supply men stocking up for a good year's trade. There has been no changes in the price lists since last writing, and dumping from American sources has been checked.

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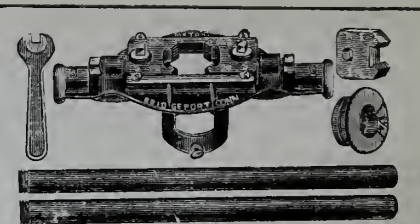
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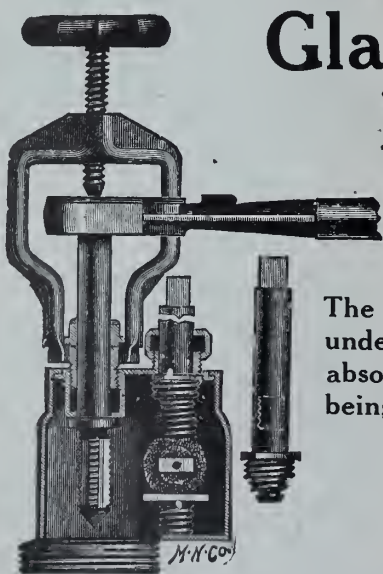
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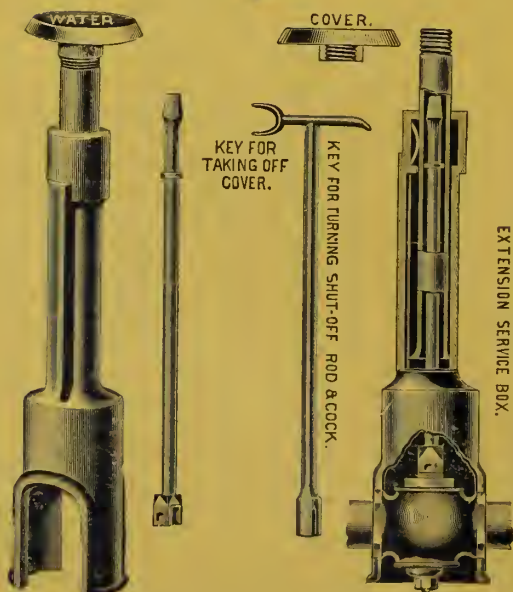
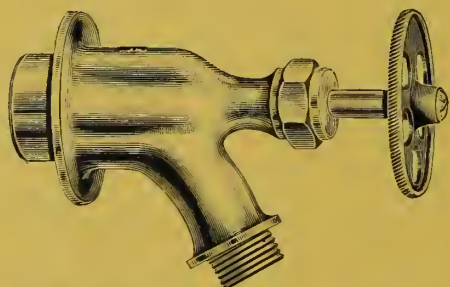
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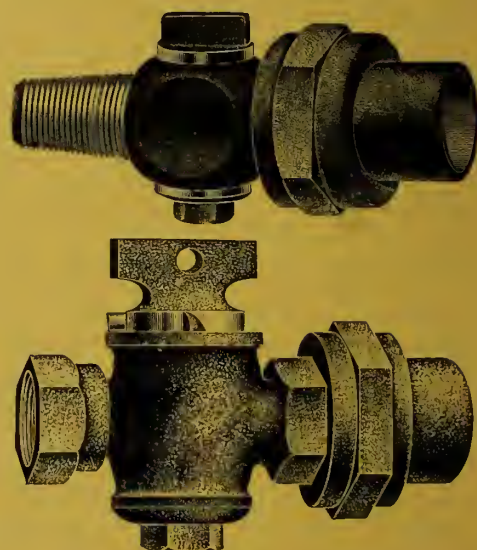
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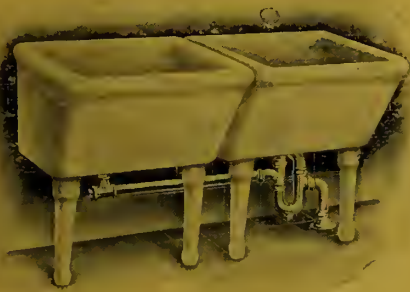


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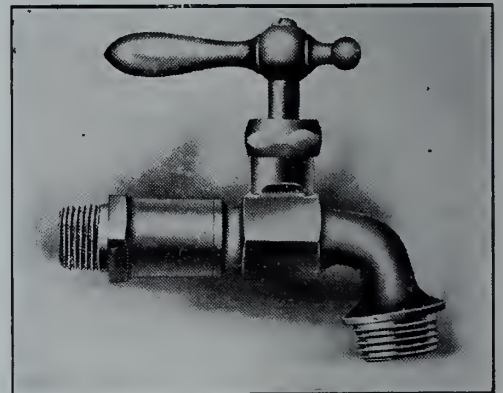
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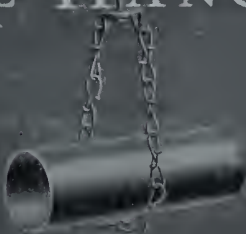
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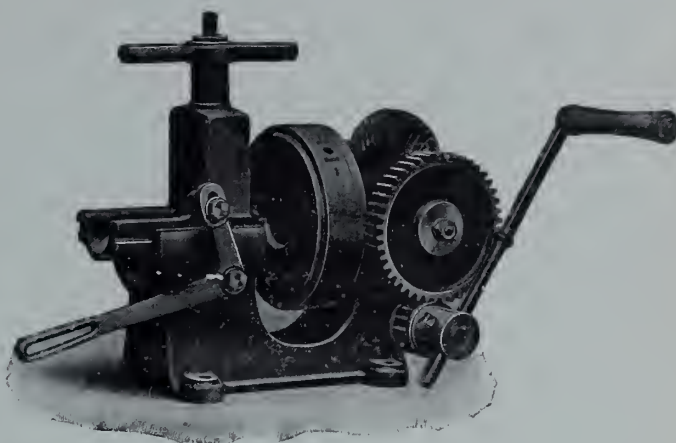
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TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co.

10 Front St. E., Toronto

Steam-Heating a City

The Central Heating System in Operation at Chatham, Ont., described for this Paper by William E. Park

"The first and only one of its kind in Canada"—such was the claim advanced by residents of the Maple City when the Chatham Steam Heating Company, Limited, inaugurated its central steam-heating system over two years ago. The claim, so far as can be learned, still holds good.

Steam heating on a small scale is probably familiar to all. Steam heating on a large scale—the heating of all the principal business places, public buildings, schools and churches of a city from one central plant—is still something of a novelty. Though it has been growing in favor on the other side during thirty years or more, the inauguration of the Chatham system in November, 1905, was in the nature of an experiment. There were plenty of people at the time who prophesied dire failure, declaring that it was impossible to transmit steam the required distance and still retain its heat. In the result, the prophets are silenced, and the system grows every day in favor.

Genesis of the Company.

The Chatham Steam Heating Company, Limited, is a twin sister of the Chatham, Wallaceburg & Lake Erie electric railway, which inaugurated its service two years ago between Chatham and Wallaceburg, and which was last fall continued through to the lake. When the company passed out of the promotion stage, among the men behind it were several American capitalists from Towanda, Pa. These men were interested in various American steam heating plants, particularly that in Lockport, N.Y., and they conceived the idea of utilizing the exhaust steam from the C. W. & L. E. power house for the heating of the city. Accordingly, a provincial charter was obtained, a separate company, capitalized at \$100,000, was formed, and a 25-year non-exclusive franchise was, after some discussion, granted by the city of Chatham. The steam heating company's mains were laid at the same time that the electric railway tracks were put down, and the service was inaugurated almost simultaneously with that of the railway, in November, 1905. The equipment was supplied and the mains were laid by the American District Steam Co., of Lockport, N.Y.

Success of the System.

A two years' trial has stamped the system a success. Though at the outset there was some difficulty in inducing Chathamites to take it up, to-day the public avail themselves of the service wherever it can possibly be obtained. It is in use in a majority of the business houses on King street, in a large number of offices, in the city market building, and the Central school, the largest public school in Ontario, in several of the largest hotels and in quite a few private residences. Any degree of heat can be secured.

Finally, having passed through the

experimental and most expensive stage, that in which the system has to install its plant, to adapt itself to local conditions, to build up its clientele, and to put everything in smooth running order, the company has just paid a semi-annual dividend of 2½ per cent. on the par value of its capital stock. This may be taken as a conclusive evidence of success.

Costly to Install.

Though the city franchise is non-exclusive and anyone is free to enter the field and compete, there is little likelihood that any man or body of men will want to do so. The system is a very expensive one to install, and a large amount of initial capital is required before there are any financial returns. For instance, the laying of the mains involves an expenditure of \$1.50 per foot, exclusive of digging and filling in.

Whence the Steam.

The leading idea behind the system is centralization of service. The other is utilization of waste. On the one hand, we have the supplying of steam from one central point, just as we supply water, gas and electric light. On the other we have the exhaust steam from the electric railway power house, which otherwise would be wasted, converted into a saleable and valuable commodity. While above ground the cars transport us hither and thither, below ground the steam from the power house brings us heat of a most comforting kind.

But this exhaust steam does not furnish the sole supply. At some hours of the day the demand for heat is heavier than at others and accordingly a large amount of live steam has to be generated in order to keep the supply up to the requirements.

Contrary to most ideas the system is not a complicated one. It is essentially simple; there is little in it that is not an adaption of the ordinary steam heating plant in an individual building, with which everyone is familiar.

The exhaust steam passes first into a sort of chest or compressor, whence it is driven at heavy pressure into the mains. The 12-inch steam main leading from the station is of sufficient capacity to supply the entire district to be served. At the street crossings, branches are taken off to supply the various side streets. As the line extends, the size of the pipes is decreased according to the amount of steam they will be expected to conduct. Along these lines, service pipes are taken off to supply residences, stores, banks, churches, and all kinds of buildings requiring heat.

Preserving the Heat.

But how is the steam kept warm? No question was more frequently asked when the franchise was first talked of, and no question had a larger influence in filling the public mind with doubt.

The great essential feature in a profitable and successful heating business is

the ability of the central plant to deliver to the customer, as nearly as possible, all the heat units contained in the steam as it enters the main at the station. Accordingly, it would be court- ing failure to bury the steam pipes underground without a protecting cover. The rapid condensation of the steam would defeat the object of the system; instead of supplying the patron with hot steam, the company would be furnishing him with cold water.

The insulation finally adopted, and the efficiency of which has been proven by actual service, is what is called a wood-log. It is a circular wooden casing having a shell four inches in thickness. This casing is lined with tin, and there is an air space between the casing and the asbestos-covered iron pipe, (designed to convey the steam), which is placed inside. The casing is formed of white pine lumber, kiln dried, the staves being grooved and tongued the full length and bound together with heavy galvanized steel wire, wound spirally. The outer surface is finally covered with asphaltum and saw dust. With this elaborate covering, steam is carried long distances with very slight condensation. At Lockport, I think, the system carries the steam a distance of seventeen miles.

The lines of pipe are all laid to a careful grade to avoid any accumulation of condensation. They are all under-drained with tile, to carry away any seepage water which may at times exist in the soil.

Necessary Devices.

Unlike pipes for gas or water, steam pipes must be provided with expansion devices. Naturally, in the city streets these should be such as to require the least possible amount of packing and attention after they are installed. To meet the need for an expansion device, what is called a variator is used. The variator, in addition to taking care of expansion, also has a fixed position, from the stationary part of which services are taken off leading to the different buildings. All expansion and other devices are enclosed in brick boxes and made completely water tight.

Another necessary device, in order that the steam pressure may be kept up as long as possible, is the angle joint device, whereby angles in the line, whether vertical or horizontal, are overcome. Instead of a sharp corner, the steam at the angle of the pipe flows through a large spherical cavity.

Further than these devices there is little in the system that is different from a small steam heating system designed to warm an individual building. The steam, having been brought thus far by the devices mentioned, is simply connected with the house system and turned on. Where service is to be supplied to buildings already equipped with radiators, but a few minor changes are required.

Where hot water radiators are in-

stalled, the steam service can be supplied from the central station with a few slight changes in apparatus. If, on the contrary, the customer desires to continue heating by hot water, this may readily be done. The steam from the street mains is supplied to a special form of water heater. This steam heats the water, instead of fuel being burnt under a boiler for that purpose. It may be added, however, that a direct steam heating system is pretty generally preferred.

The condensation from the steam is conveyed to and through a cast iron economizing coil, or form of hot water radiator, in the basement. This coil is placed in a tin-lined inclosure, together with a steam trap. In the floor above the enclosure a register delivers the heat from this coil to the room above. From this coil, after all the available heat has been utilized, the water flows to the meter, which records the condensation in pounds. The customer pays the established price per thousand pounds of water for that which is condensed in his building. Where dry steam has been delivered in this way and condensed in the radiators, every pound of water registered by the meter shows that a given number of heat units has been delivered. The meter system is universally used.

Reckoning the Cost.

Is the system cheaper than others? From a money point of view, the answer is, No! It has never been claimed that a specified amount spent in steam heat will do more than the same amount spent in coal.

But there is another point of view which will appeal to business men particularly, whose time is worth money and whose health, and the health of whose employees, is of more value than mere dollars. The central steam heating system involves benefits which no individual system can pretend to offer. The supply of heat is steady, and available at all hours. Steam is turned in to the mains as soon as there are indications of cold weather, and the supply is constant, day and night, throughout the heating season. Ladies and even children can readily control the heating apparatus at all times. The heat can be turned on in an instant, and turned off just as quickly.

There is no boiler to be installed. There are no fires to build. There are no ashes to remove, nor is there dust. Nine-tenths of the risk from fire is obviated. An increased amount of space is available for other purposes, thanks to the absence of boilers, coal bins, ash piles, and the many things necessary to an individual heating system. There is a more even distribution of heat throughout the building than where furnaces or stoves are used, and there is an immense saving in time and labor. Instead of spending half an hour lighting the fires or feeding the furnace, all the patron has to do is to turn open a valve, and the warmth comes rushing into the place in a moment.

These are the advantages of the system, and it is to these things, rather than to any reduction in the apparent cost, that the popularity of the central heating system here is largely due.

Regina master plumbers held a meeting on March 7 to confer with the journeymen about working arrangements for the coming season.

WASTE HEAT UTILIZED.

An interesting application of waste heat from enameling furnaces to the warming of a building is presented in an installation being made by the Massachusetts Fan Company, Watertown, Mass. This consists of two steel plate motor-driven fans, so placed in connection with a piping system at the plant of the Carnahan Stamping & Enameling Company, Canton, Ohio, as to draw the waste heat from the furnaces, and thence distribute it by means of another piping system through an adjoining building. The system is similar to that frequently applied in connection with the utilization of waste heat from brick kilns, and the economy secured is comparable thereto.

FIRING HOT WATER BOILERS.

In common with hundreds of other mechanical devices, a hot water heating system often fails to give the maximum of satisfaction because of a lack of knowledge respecting its operation on the part of the owner, says Building Management, and in that way it often happens that a steamfitter obtains an undeserved bad reputation because he has either not realized or has overlooked the necessity of properly instructing his customer how to operate a heating system after the same has been properly installed, and in order to correct some false impressions existing in the minds of many people respecting the care and method of dealing with their heating appliances, it may be well to explain what has been found in practice to be the best rule to be followed in the care of a hot water boiler.

First, it must be assumed, of course, that the boiler is connected to a suitable flue, i.e., one that is of suitable diameter and height, reasonably smooth and with tight mortar joints, so that there will be no suction of air from any point except through the smoke pipe, and that the boiler sections will be thoroughly swept out once a week, or oftener, according to the character of the fuel and the amount of ashes and soot deposited on the sections, for it must be borne in mind that a layer of ashes, say half an inch thick, on the top of each section will reduce the capacity of the boiler perhaps 30 per cent. by insulating the iron from the passing heat.

The complaint most often heard is that the house is cold in the morning and that a fair temperature cannot be obtained until about the middle of the day, and this in most cases is due to faulty firing on the part of the owner, because if a fair temperature may be obtained during any part of the twenty-four hours, it follows that the system has ample capacity, and that if a little care is taken, an equally high temperature may be obtained at any other time during the day.

A Common Mistake.

Now, what is the cause of a drop in temperature in the morning? It is due to a combination of two circumstances, viz., first, to the well known fact that the lowest temperature during the 24 hours is about 4 o'clock a.m., and, secondly, and vastly more important, to the fact that the owner usually adopts a wrong course in preparing a fire for the night just before he goes to bed; for instance, it is a common practice to

shake the grates, put in a considerable amount of fresh coal and turn on the drafts for twenty or thirty minutes "to burn the gas off," and herein lies the great mistake, because the fire gets such a good start in this way and there is so much fresh fuel that the hottest fire during the 24 hours is likely to be about two o'clock in the morning, and from that time it gradually dies down so that at the end of the next six or seven hours, or about eight o'clock in the morning, the fire is almost entirely burnt out and the flat is cold.

To overcome the resulting difficulty it has been found good practice, first, to shake the fire very little in the morning, and put on some fresh coal, to which may be added two or three times during the day enough coal to keep the temperature sufficiently high, so that about ten or eleven o'clock at night there will be three or four inches of good clean fire on the surface and several inches of ashes on the grate.

Gases Escape Through Chimney.

If the grate then is given a good, vigorous shaking and all of the ashes cleaned out, there will be enough room to place in the fire pot a considerable body of fresh coal. The furnace doors then should be entirely closed up, and the key damper in the smoke pipe placed in such a position as experience with each individual chimney will dictate would produce the best results. The damper in the fire door should be left open in order that sufficient oxygen may be drawn in to mingle with the gas given off by the coal and produce combustion, otherwise, all of the gases will pass up through the chimney without burning, and will be a total loss.

It will be found that the fire will begin to burn up slightly about one o'clock in the morning and will gradually increase in intensity until, say, five or six o'clock, when there will be found to be a good hot bed of coal in the boiler and a very comfortable temperature throughout the house.

The necessity for a vigorous shaking of the fire in the morning is obviated, and the ashes are permitted to accumulate, so that the operation of the night before may be repeated.

Firing the boiler in this way will be found to give the best of satisfaction, and, if the radiators are not kept hot when there is a good fire on, the plumber might pay especial attention to the quality of the coal, which is entirely responsible in many cases where he, and the boiler that he installed, has received unmerited blame.

POOR PLUMBING CAUSE OF SICKNESS.

While the sanitary condition of the country at large has in the last few years made rapid advancement and the societies for the bettering of unsanitary conditions are doing good work, still individual cases are continually brought to our attention where the first rudiments of sanitary science do not seem to be observed.

Such a case is presented in a western city, where in an endeavor to ascertain the cause of the sickness that had become chronic at a children's home, the directors of that charitable institution ordered an examination of the plumbing, which was found in very bad shape.

PLUMBER AND STEAMFITTER

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A BUSINESS REVIVAL.

With the breaking up which comes in March, there will come a revival of building operations. Money which for a number of years has found a channel for investment in other directions will this year be turned into the improvement of vacant property, returns from that source having been shown to be more satisfactory than in more speculative methods of investment.

The master plumber and steamfitter will carefully take account of stock this month, will order all the goods his business will stand, because he needs them, and because the present low markets may not continue.

That there is going to be the usual amount of higher class residence construction is already assured, and architects have on the average as much of this class of work on hand as is usual at this season of year. There are also many large buildings which were not

completed last year, and which will be pushed along as soon as weather permits in the spring, which represent a considerable outlay of capital. The outlook for speculative building is, of course, not good, but the expenditure on eivie undertakings should aggregate more during the coming season than usual.

The future of this country is too well assured and the farmers are too large and influential a class to permit of it receiving a serious setback. When the present uneasiness wears off there will be a notable increase in building operations in all parts of Canada.

IS CENTRAL HEATING A SUCCESS?

A proposal that the central station heating companies in New York State be placed under the direction of the Public Service Commission, coupled with the reports of complaints made against such companies where they have recently begun operating in the middle west, says the Heating and Ventilating Magazine, calls attention to an objectionable feature of such plants which out-weighs many of their advantages. In both cases, cited, the trouble complained of is that the heating companies, in accordance with the terms of their franchises, are continually tearing up the streets at all times of the day and night for the purpose of making repairs. The result has been that the streets in some cities are in a constant state of repair due to excavations made by the heating companies, while, in others, the failure of the companies to repair the streets properly has led to an even worse condition.

As a result of the situation, some of the eastern cities are having a quiet laugh at their western friends, who have prided themselves upon their improved facilities for heating. One writer in the Springfield, (Mass.), Republican, says: "It will serve to remind Springfield people of the fact that this thing (central station heating) was tried out in this city and finally abandoned. It will be remembered that the local gaslight company for years maintained a large heating plant, and the result was not desirable, so far as the streets were concerned. Not only was the snow quickly melted off in winter, but there was involved a constant and most annoying digging up of the surface of the streets. The nuisance of it finally became so great that the gaslight company abandoned the field of its operations, much to the general satisfaction."

WHEN CREDIT BECOMES A LOAN.

Every merchant who sells on credit is a partner with the buyer to the extent of his sale during the period claps-

ing until payment is made, and as such has a right to know the financial condition of his debtor. This sense of partnership is rarely recognized by either party to the sale. Every man should regard a time sale as a money loan. He would not care to ask his jobber for the loan of an account of money equal to the value of the goods he buys on time. But he does the equivalent of that when he asks the jobber to extend his credit beyond the time for payments set by the terms agreed upon. The Credit Men's Bulletin says: If the buyer were to go to his bank and borrow the money necessary to pay for the goods on the same time, he would not only have to pay the legal rate of interest, but a premium besides, and if he did not meet the obligation on its maturity would have to satisfy the bank that the account was good and collectable, and, of course, pay interest for the extended time. Does the salesman realize when he is closing a sale with a customer that he is virtually lending that customer a sum of money equal to the value of the goods for the period that shall elapse before payment is made? And does the buyer realize that in asking for credit, he is only for ten days, he is asking the seller the favor of a cash loan? A realization of this actual relationship between buyer and seller would lead to greater self-respect and firmness on the part of the seller, and what is more important, fewer losses; while there is many a buyer whose attitude toward the seller would be vastly more improved by a recognition of this homely truth, and who would steer his course clear of many a dangerous financial rock thereby.

MAKE WINDMILLS SUPPLY HEAT.

An interesting suggestion is going the rounds of the western papers that beats the scheme of the Kansas City negro who secured hot water for heating purposes through the friction of a wheel revolving in the tank containing the water and operated by a gas engine. The new scheme is attributed to Prof. H. W. Wiley, the Government's chemist in chief, who says, "Make the wind heat your houses. Do it by means of windmills. No such windmills as we have now, but scientifically-constructed windmills. Properly utilized, an ordinary windmill with eight-foot sails would be capable of keeping the ordinary dwelling at a temperature of 70 degrees F. all winter. Electric heaters suitable for the purpose are already on the market. The winds which hitherto have been permitted to go almost entirely to waste, will be a source of heat, light and power for ages after the coal fields and oil wells of the world are exhausted."

UNFAIR COMPETITION.

The temptation to "cut the price" is at times over-mastering; but when induced by a desire to gain some temporary advantage over a competitor, it inevitably leads to sustaining a collateral loss. Competition will always exist and when fair, it is the life of trade. When unfair, it sounds the death knell of fair competition, destroys confidence, reduces values and injures manufacturer, jobber and consumer alike. It is the mother of a horde of ills experienced by the trade, from which arise bitter complaints, said J. E. Lewis, Pittsburg, in an address before a meeting of supply men and manufacturers at New York last month.

The manufacturer produces various grades or qualities of a given commodity in enameled goods, soil pipe, brass goods, range boilers, tanks and seats, etc., to meet the demands and place the commodity within the reach of all. The jobber is fully aware of this difference in quality and the master plumber is well informed, the consumer appearing to be the sole one in interest not fully informed on the subject.

* * *

Is it fair or unfair competition that will lead a house or factory to place goods of secondary quality in competition with those of first grade, and represent them as being just as good?

Is it fair or unfair competition that will take part of the first grade article and equip it with fittings of second, third, or no quality at all?

Unfair competition forces the honestly disposed manufacturer or jobber, to face the condition where "passable" goods are substituted for "good"; where the "good" is substituted for the "perfect."

Water conditions require the use of fourteen or sixteen ounce linings in tanks. There is some business in sight and the customer really wants you to get the order, if you will but meet the price he has been quoted. You pass up the order, for you have gone the limit of value and quality. The consumer will probably think you have tried to rob him, and you will wonder how such a value was possible. Investigation shows that a ten or twelve-ounce lining has been furnished, or, if that be not the explanation, that an inferior quality of half-cock has been used and possibly a poorly finished piece of woodwork furnished.

The situation is clear in an instant. The customer has been robbed. He may not realize it at the moment, but it will be discovered when the bills for repairs begin to come in. The honest jobber has been beaten out of an order and defrauded thereby of a fair return on the business that fair competition would have insured him.

The train of evils growing out of such unfair practices, should influence those desirous of fair competition, to demand that the quality or grade of goods be so marked or stamped, that the consumer may not only be able to discriminate between the several grades, but that he may know the manufacturer as well; that he may identify the goods installed as those selected by him.

* * *

The evil is not confined to one or two articles handled by the trade, but extends its baleful influence in many other directions. A well known manufacturer of soil pipe has this to say on the subject:

"Many foundries are selling extra heavy pipe, from ten to twenty per cent. under schedule weights; the cut in weight being made to enable the maker to reduce his prices, and still keep within the production costs. We are making our goods within the five per cent. of published weights; some pieces running over, and some under, but all within the five per cent. of schedule. We will not deviate from this policy, and the deception is unfair competition, and the light pipe stamps the seller as unreliable."

The practice has grown so chronic in enameled goods, that a manufacturer of that product has adopted a system of espionage to see that wherever his goods are specified, no other of inferior kind or quality shall be substituted.

In range boilers there is a very wide field to exploit unfair methods. Here is to be found a thirty-gallon "standard" tested to two hundred pounds. There are others, and they look alike to the uninformed. One is true blue and fills the specifications; the second will run shy in capacity; the third can be handled by assuming all the risk of damage or loss of life that may follow its use.

* * *

When John Trix, president of the American Injector Company, wrote these words: "The market is being flooded, in the brass goods line especially, with some of the poorest material that will hang together," he simply directed attention to another and possibly the widest field for the practice of unfair competition. It is not to be wondered at that he strongly favors marking or stamping a product, that not only its quality would be made known, but that the manufacturer of the commodity would be equally well identified.

* * *

At no period in the history of the trade has it been so essential to its interests that a better margin be obtained on goods sold, and probably at no time was there so many obstacles to prevent this realization.

The depressed condition of business is not answerable for it all, nor does the recent judgment determining that any association, or any two or more persons should not only avoid fixing a price at which their goods will be sold, but that they should avoid any restriction determining the class of persons with whom the members or persons will deal and explain fully the difficulty.

To the unfair practices of more prosperous days, which have slowly yet surely tended to the destruction of confidence, can be traced not only a large proportion of the ills now endured, but the prime difficulty in establishing better conditions.

Theories have been advanced, and plans have been formulated to secure better conditions. Reciprocity attempted a solution, and the resale price was suggested as a corner stone. Neither have as yet realized the hopes or expectations of the projectors.

* * *

Reciprocity failed, because as outlined it established a restriction determining the class of persons with whom one shall deal. Resale price failed, because of fear that the other fellow would use it for yet further unfair practices.

Necessity gave birth to both propositions, and either one of them possessed the merit of an honest endeavor to improve the conditions of trade.

Simply to dream of realizing expectations, would be like wishing for something without action or effort to secure the wish. The dream will never be realized, nor will the wish be gratified, unless a burning, consuming fire of desire impels action to secure the object.

* * *

Discontinue unfair practices; talk plainly and forcefully against them; urge "quality" on the attention of every one; make it plain to the consuming trade why you do not meet the price of an unfair competitor, and show him how a small saving in first cost will ultimately add to his expense and trouble in needed repair work.

Eliminate the necessity for doing these things, and reciprocity, resale price, or any other good thing is at the command of the trade for the asking.

STEAM-HEATED FLATS.

A bill has been introduced in the New York Legislature regulating the steam heating of flats in cities of the first class.

If the bill becomes a law, steam heat must hereafter be provided in flats having steam-heating apparatus whenever the outside temperature is as low as 60 degrees Fahrenheit. Landlords must also always keep on hand a certain specified amount of coal.

Main Trap an Unsanitary Fitting

By Andrew J. Burnett, Inspector of Plumbing, Melrose, Mass., Before the American Society of Plumbing and Sanitary Inspectors at Chicago, Feb. 12, 1908.

I am so thoroughly satisfied by inspections personally made that the main drain trap is an unsanitary fitting that I propose to recommend to the Board of Health of Stoneham, Mass., of which town I am the inspector, that they abolish the use of the main drain trap. The first reason is that I am convinced that it is unsanitary and a useless, unnecessary expense. This trap cannot be classed with traps like those that almost every ordinance requires that a distance from fixture shall not exceed 3 feet, and that class of trap for which there must be less than 3 feet of waste pipe from $1\frac{1}{4}$ to 2 inches in diameter. Thus you can see there must be less than 3 feet of dead air space, making the opportunity far less for the formation of unhealthy odors and creation of sewer gas by the sediment that may be retained from the dead air space.

Dead Air Space in Main Drain.

To base our argument it would be fair to estimate 50 feet to stack of pipe. So you can see that it is not fair to compare the fixture trap to that of the main drain trap, which is not less than 4 in. in diameter, with a dead air space of about 50 feet, and possibly 20 feet or more, which is located in the basement, laid in a trench, with a fall of not more than $\frac{1}{4}$ in. to a foot. Such a condition would furnish a splendid opportunity to retain the soil substance. I will leave it to you to say what soil sediment will produce when confined in a dead air space. Is there any reason to believe that it would not remain in this pipe under such conditions with your trap to retard the flow? Why, then, use so much water for the purpose of flushing out soil matter, if you intended to destroy its effect by placing such an obstruction as a main drain trap and at the same time establish a receptacle for retaining soil matter in your house when you go to the expense to deposit the same into the main sewer?

Ventilate Sewer Through House Drains.

What will the general public think of the plumbers who have talked ventilation to a standstill if they discover that they advocate a dead air space of 40 or 50 feet in the 4-in. or larger pipe? These arguments do not hold together. Now take away that barrier and allow soil matter to be flushed into the main sewer without interruption and introduce a circulation of air. Don't be so narrow-minded as to believe it is wrong to allow a sewer to be ventilated through house drains. The opportunity for the formation of sewer gas, if it ever did exist, would be greatly diminished if only a part of the house connections were so constructed. If you will look at the iron manhole covers on the main sewers in the public streets and see how little consideration the civil engineers gave the question of ventilation, you will see only a few holes drilled through them, and they are generally stopped up with snow, ice, etc., a greater part of the time.

The fresh air inlet will produce a partial result of which I seek, but that, like the house trap, has its evil effects; backdrafts must always be reckoned with, and I have seen them many times on lawns and under piazzas, when the odors that came from them was certainly obnoxious, and again, if there is any virtue in them, it is often destroyed by children filling them with sticks, stones, sand, etc. The introduction of the cold air also increases the liability of freezing, and in some exposed locations the strong circulation of air will cause the water which forms the seal in the water closet to fluctuate to such an extent as to destroy the seal. There are many cities and towns in my vicinity that require the use of the trap, but prohibit the fresh air inlet.

Discussion Address.

Mr. Burnett's address was followed by a discussion, the gist of which follows:

H. W. McVea.—I fully indorse the position taken in Mr. Burnett's paper. Our sewers are small, and we do not allow rain water to enter them.

Mr. Cotter.—In a city with buildings of extremely unequal height the house trap is essential.

Mr. Stolz.—The house trap protects the home when some of its other equipment is out of order.

F. H. Wright.—I think the house trap is like the vermiform appendage, of unknown usefulness.

A. C. Shaver.—You have overlooked that there is a section of our country more than 100 miles from here where the climatic conditions bring rains that make it impossible to take care of the storm water in the sewers. We have a city of 50,000 without a house trap in it, and we have never had any typhoid

or similar epidemic. We ventilate through the house drainage system.

Mr. Cotter.—I believe that a house trap is unnecessary in Pasadena, and that different parts of our country require different equipment.

Mr. Ball.—Investigations in foreign countries have to my mind demonstrated that the disease germs cannot find their way from one house to another through wet drains.

W. H. Jennish.—Last winter Dr. Ames stated that a bend in a pipe would cause a dampness that prevented the travel of germs.

Mr. Wright.—I find the air passes down the house drainage system following the flow of water oftener than in the opposite direction.

I. A. Lederer.—To discuss the separate trapping of fixtures we consider every opening into the drain a separate fixture whether it is a rain leader or a lavatory.

Mr. Ball.—A fixture in my mind is everything that has a supply and a waste opening.

Mr. McVea.—A suit under my notice brought the decision that every supply and waste opening made a separate fixture.

Mr. Luff.—If there are three fixtures, one trap to the centre fixture can receive the waste from the fixture on each side if not more than 24 ins. distant, according to the Cleveland code.

Mr. Quinn.—Would a battery of 20 lavatories be one fixture in the eyes of a court trying a suit?

Mr. Claffy.—I think the ordinance and its interpretation by experts as to its purpose would make the judge decide that more traps were necessary.

Mr. Wright.—In Helena, Ark., a decision was that each supply and waste opening constituted a fixture.

Main Trap Further Discussed

By "Hy Jean," in the Plumbers' Trade Journal.

The question of the main trap is a time-honored question among plumbers, and has been thrashed out scores of times. Nevertheless, it is always of interest, and a renewal of the subject will not be without interest to our readers. We believe that most large cities are today using the main trap, although, of course, there are some notable exceptions, and as shown further on there are special reasons why its use is of particular advantage in the case of large cities.

In revising its plumbing code, the City of Cincinnati is at the present time debating concerning the future use or non-use of the main trap, and it is this fact that brings the subject particularly to mind at this time.

The old-time idea of the main trap and the fresh air inlet, which is a necessary adjunct of the main trap, is shown in Fig. 1. This shows the fresh air taken directly from the trap, which not only cut out one of the trap cleanouts, but resulted in bringing in upon the trap seal a current of cold air, which often caused the freezing of the trap seal, or, at least, so chilled it as to separate the grease from the waste, and cause ultimate stoppage of the trap.

This objectionable feature has been very largely overcome by the connection of the fresh air inlet back of the trap, to a tee or Y branch. Besides lessening the liability of freezing the connection allows the use of two cleanouts. In this connection we call

attention to the method of connecting the main trap shown in Fig. 3, which is of special advantage as it allows the use of an end and cleanout by means of which the house sewer may be cleared in the event of stoppage.

With the main trap and fresh air inlet installed according to modern ideas, we believe that the arguments against its use are reduced to a single one that is of importance.

The point mentioned is that when the main trap is used on the house drain, its presence prevents the use of the stacks passing through the roofs of the town or city from supplying a system of vents for the public sewers.

While it is undoubtedly true that the system of public sewers of any city requires ventilation, the turning of every stack in the city into a vent for the sewer is certainly a serious and debatable matter.

Before finishing the subject, we shall see just what this would mean to the inmates of the house. While not denying that if this ventilation could be provided through each house without seri-

tive joints and connections and other defects. The main trap acts as a protection against the entrance of gases into the house through such defects.

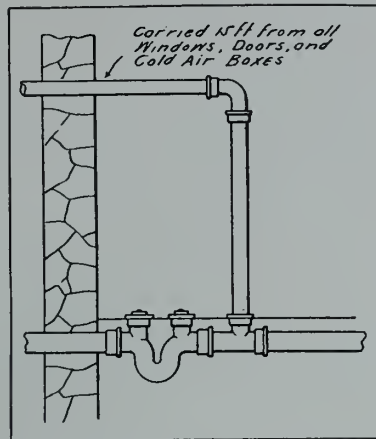


Fig. 2—Correct Fresh Air Inlet Connection.

The possible breaking of trap seals through siphonage, or through evaporation, leaves the living rooms of the house open to the entrance of gases and odors, which the main trap would intercept. The evaporation of the seals of traps on floor, cellar, and rain leader traps during prolonged periods of drought present danger to the inmates. The trap on the refrigerator drip sink is especially liable to lose its seal from evaporation during the months when not in use, this thing occurring unknown to the inmates, who in most cases cannot be expected to take measures to keep the seal intact.

When the water closet bowl becomes broken below the trap, when the water closet bowl is removed in the case of repairs, and whenever any fixture waste is disconnected for repairs, if there is no main trap on the house drain, there is always direct communication from of the house.

As everyone knows, when such re-

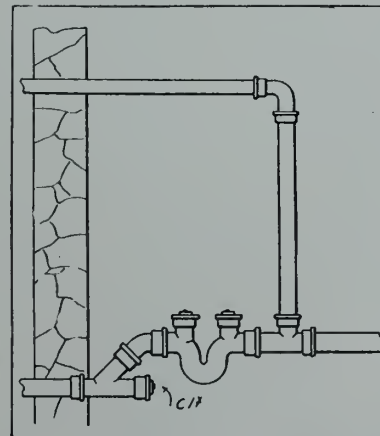


Fig. 3—An Excellent Connection at Main Trap.

pairs are being made the connection often remains broken over night, and the sewer into the living apartments for a considerable time, and that there

is danger in such things cannot be denied.

If there was only a single instance in which danger might arise from the absence of the main trap, we should under many circumstances be willing to take the chance, but there are so many ways in which danger may arise in a perfectly natural way, that we cannot but believe that the main trap serves a most useful purpose, and that the plumbing system should not be without it.

A special feature that arises in many sections of our large cities may be seen from Fig. 4, which represents two buildings side by side, one being a low building and the other a high building. If the house drain of the low building is not provided with a main trap, every stack which passes through the roof must certainly be throwing out gases

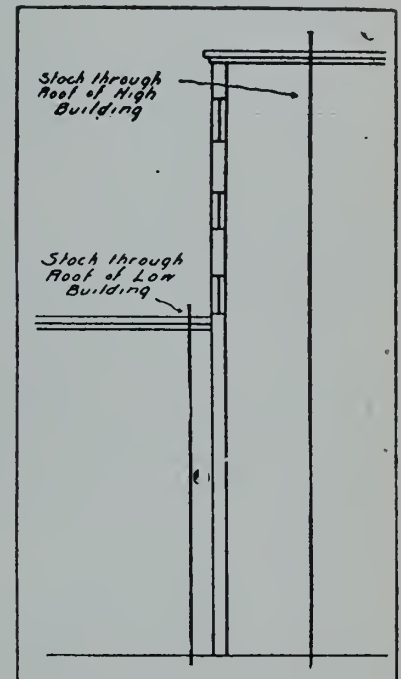


Fig. 4—Stacks in Buildings on City Business Streets.

and odors from the sewer, which draw in through the windows of the floors in the high building which are above. This, when it is considered, must be a serious matter, and a very common one, too, for these conditions, especially in the large cities, are of most common occurrence.

The disadvantages which we have enumerated are not all that exist when the main trap is thrown out. These disadvantages, we may add, are not mere words, but they actually exist, and it seems to us that the right thing to do is to guard against such dangers by using the main trap in preference to any other.

The contract for the new government public buildings to be erected at Delhi have been let, the successful tenderers being Shultz Bros., Brantford. The contract price is in the neighborhood of \$30,000.

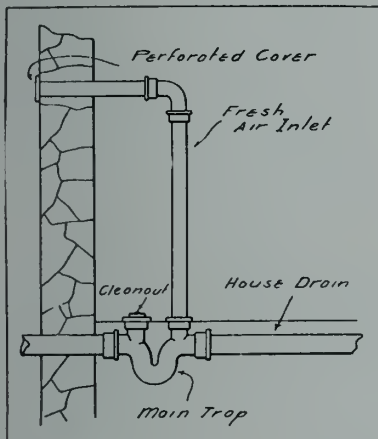


Fig. 1—Main Trap with Old Style Fresh Air Inlet Connection.

ous results, it would be an excellent method of venting the sewers, we believe the disadvantages of such practice to be too great to warrant the disuse of the main trap.

The plumbing system of to-day is a complicated affair in many cases. It not only receives the waste from all fixtures, but floor drains, yard drains, cellar drains, rain leaders, refrigerators, etc., are also connected with it, and all these connections must be taken into consideration when the main trap question is taken up. To our mind, the main trap represents a protection for the entire building, fixtures, joints, and all the special connections mentioned. Some of the conditions and results that may arise without the use of a main trap we will mention, as follows:

In the first place, while under our modern system of inspection a newly constructed plumbing system may be tight, there is no question whatever that a test applied later, after the building has been in use for a time, and the foundations and floors have settled, as they often do, would show many defec-

Domestic Septic Tanks

A Paper by H. F. Shade, Plumbing and Sanitary Inspector, Victoria, B.C., Read Before the American Society of Plumbing and Sanitary Inspectors at Chicago in February.

The question of the disposal of sewage from our homes, and buildings that are isolated from the service of a sewer system, without creating a nuisance dangerous to health, may be, to the non-technical mind, simple enough, but

we are indebted that this crude but once general way of disposal is fast being displaced by the more modern biological or "septic tank" method.

Septic Cess Pools.

A few years ago the writer, knowing of several instances where cess-pools had been in use for a period covering from five to seven years, without the necessity of their contents being removed, and having heard of the septic tank experiment at Exeter, started out to investigate with the view of improving the cess-pool. It was found, in every case where these pools did not require the removal of sewage at regular intervals, a heavy crust or scum had formed on the top, and the inlet pipe discharged either below the water level of the pool or so placed that it did not disturb this scum; it was evident from this that the scum produced a septic action sufficient to disorganize a large portion of the organic matter in the sewage, and all that was required to complete the work was to encourage sufficient septic action to cope with and disorganize all the incoming sewage matter. It will be better understood that a septic action is a bacterial conflict where myriads of micro-organisms, peculiar to themselves, attack and disorganize the organic matter, and through their action, revert it back to the elemental state.

Submerged Pipes.

The first improvements were to enlarge the tank and submerge the out-

let fairly clear, but finally darkened with considerable odor. With the inlet pipe submerged, as above mentioned, it would often block at a point as indicated at X on Fig. 1. It was conclusive from this that the inlet pipe was submerged too far below the water line, as the sewage did not have sufficient force to pass down through the two feet of submerged pipe into the tank. By sounding the bottom of the tank it was found that a heavy black sediment had precipitated. From these facts it was evident that the inlet and outlet pipe were carried too far below the water line.

Subsequently it was found that if the inlet pipe was brought about 12 inches below the water line it would neither disturb the septic scum or become blocked at this point as before, and that by raising the outlet to about the centre of the depth of the tank, the effluent would not be polluted by this black sediment at the bottom, and at this depth there was no danger of the scum being removed through the outlet leg. This information was derived from tanks approximately six feet square, intended for a capacity of from six to eight persons. Later, it was found that by building the tank in proportion to the amount of sewage to be treated and by elongating it so as to eliminate any current or movement in the tank, the scum could be kept in perfect stillness, this being of vital importance, for, in order to maintain the septic action, this must on no account be disturbed. These tanks were calculated on a basis of forty gallons per capita per diem, allowing two feet of floating or superficial area for each person.

Hard to Get Data.

Previous to this time data on the bacterial treatment of sewage for small works of this kind was unobtainable, but latterly the writer has collected considerable for septic tank treatment on a larger scale, and even at this date very few data can be obtained for requirements similar to those treated in this paper.

All that has been touched upon so far is the question of tanks for ordinary residences with from four to eight persons, where the effluent is discharged into the sea, or other uncontaminable outlet, or into some surface or other drain leading thereto. The necessity of having it for larger private uses where the flow of sewage fluctuates, for instance, summer boarding houses, schools, etc., and where the effluent discharges into rivers or streams that are used for water supply purposes, will, however, be dealt with here.

Tank for Fluctuating Charges.

It will be readily seen that tanks designed for the maximum capacity of summer boarding houses would be far too large for the minimum or winter capacity, as we are told by bacteriologists that if the tank is too large the incoming sewage will not be sufficient to maintain the septic action, and in consequence, a clear effluent will not be produced. To overcome this difficulty, divisional boards are arranged in the tank, so spaced that for minimum uses, only a small portion of the tank is used for purposes of disintegration, while the others are being used for filtering—this is better explained by plan 2. These boards are three in number, dividing the tank into four compart-

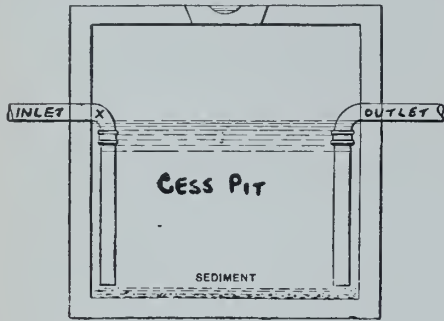


Fig. 1.—Section of Simple Septic Tank.

to those entrusted with its design and construction, it has been and is an exceedingly complex matter. In view of the ever-increasing attention which is being paid to this department of sanitary science within the past few years, the following may be of some interest:

I realize, that, apart from my description from a mechanical standpoint, anything I may say to those who have made a study of bacteriology, regarding the benefit and importance of biological treatment of sewage would be superfluous, but it is offered to those who, like the writer, are ignorant of chemistry.

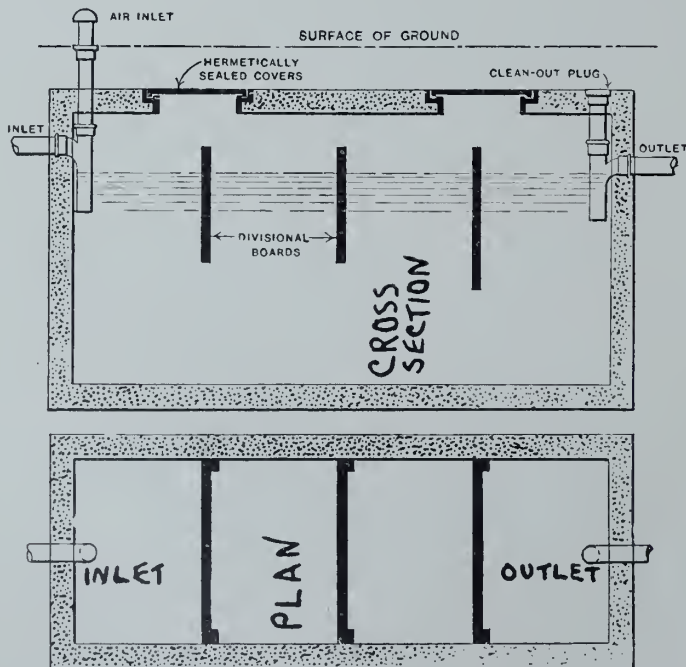


Fig. 2.—Septic Tank with Baffle Boards.

The old story of the leaky cess-pool and the polluted well, with their attendant evils, is too well known to be repeated here, and it is to science that

let in the same manner as the inlet at a depth of about two feet below the water level. The result of this was closely watched and the effluent at first was

ments. Assuming we allow forty gallons per capita per diem, (where houses have water supply ad lib.,) and the dimensions of the tank are 12 feet by 4 feet by 6 feet, it will be seen that the first compartment is capable of treating the sewage of ten persons. When the incoming sewage exceeds that amount, it will pass under the first divisional board to the next compartment, and so on. It is highly essential that the maximum capacity should not exceed that of the first three compartments, in order that it be possible that the fourth or last one be used for filtration purposes.

In localities where there are no facilities for draining off the effluent, and where the soil is sandy or of a porous nature, it is taken care of and distributed by a system of tile drainage; this is sometimes called "sub-soil irrigation." In this case, as well as in all others, the location of the tank is a most important feature, and should only

overflow would discharge, for instance, into rivers or streams used for water supply, or into surface irrigation drains, it is highly important that the sewage pass through a second stage, called "oxidation," or "aeration." This is usually done in large systems by contact beds or percolating filters, which are designed so that the air is admitted on all sides, in order that perfect aeration may take place. This aeration is essential for the maintenance of the existence of the anaerobic bacteria, which colonize in the interstices of the filter, and perform the second stage necessary to have the effluent free from all dangerous bacterial life.

Air to Assist Aeration.

For small septic tanks filters or contact beds are not generally applicable, for the reason that they require considerable care and attention. For this purpose an underground system of drain

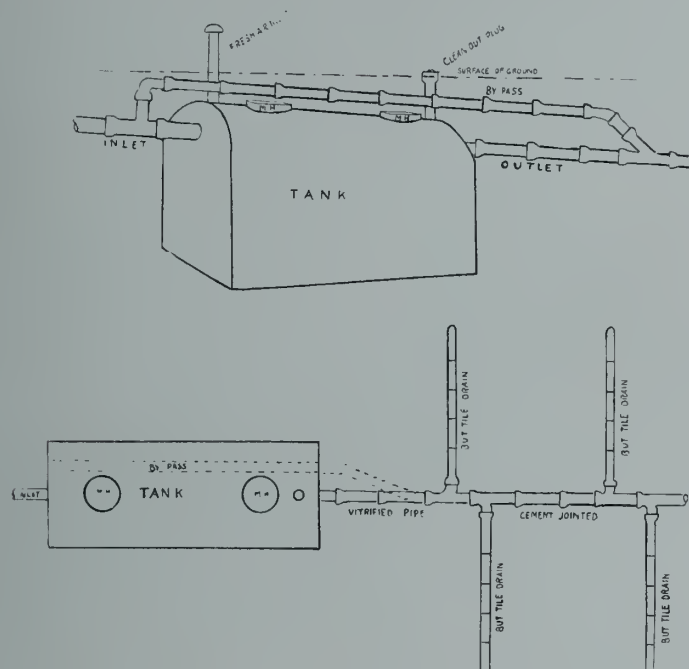


Fig. 3.—Tank with Underground Tile for Discharge.

be arrived at after a careful study of the local conditions and other details. Ordinarily, it is better to have it situated on the highest ground possible, and as far from the house as convenient, (although the latter condition is not imperative), so that if the effluent has to be percolated into the sub-soil, its velocity will be greater through the tile drainage system, and consequently will be discharged over a greater area.

Disposition of Effluent.

We are told by bacteriologists that the effluent of septic tanks is simply liquefied sewage thus its gets its name, "liquefaction," which really means that the organic matter is disorganized and made soluble in water, and, though the effluent may be perfectly odorless, it may contain a countless number of pathogenic or disease-bearing bacteria. The character of the effluent may be such that it could be disposed of by drains running into the sea or other outlets not likely to become contaminated, but, on the other hand, in cases where the

tile, carefully laid out, with frequent openings to the surface for the admission of fresh air, lends itself as the proper and most effective arrangements for small systems of this kind. A bypass around the tank to the sewer line would naturally encourage a draught down the openings and through the tile drain. In this way the liquefied sewage, on leaving the tank, is completely aerated and freed from all dangerous pathogenic bacteria.

This is, in my opinion, the best system of sewage disposal for isolated houses and will be found to overcome many of the difficulties which the use of the cess-pit produces. It is simplicity itself, automatic, and without any syphonic or mechanical appliances. I have personally supervised the construction of at least two hundred of such tanks and have yet to hear the first complaint of them not working satisfactorily.

W. L. Tait, Vancouver, will erect an apartment house at that place to cost \$25,000.

SEPTIC TANKS ACTING DIFFERENTLY.

Two septic tanks which are so alike in their method of operation and so unlike in their results that they present an interesting problem are situated in New Jersey. Both were put in operation about the same time, in 1902. One is at Red Bank, N.J. This tank is a home-made affair, made out of an old gas holder, circular and about 43 feet in diameter, with a conical bottom, so that the centre depth is about 5 feet and the depth at the edge about 9 feet. Its capacity is 100,000 gallons, and the estimated daily flow of sewage is 250,000 gallons, although that varies widely, there being a great deal of storm water, not only from surface openings, but from leakage into the sewer. The tank was put in operation in 1902 and has never been touched from that day to this. At present there is almost nothing on the bottom, but on the surface there is a scum fully 2½ feet thick of the cleanest, nicest sort of stuff I ever found in a septic tank. It is supporting quite a growth of mushrooms and vegetable matter of different sorts, and when broken into presents an appearance not unlike garden soil—rich, sandy loam.

In contrast with that is the other tank at Plainfield, N.J. It was built at the same time and has a capacity of about half a million gallons, with a daily flow of 1,000,000 gallons, so that its period of storage is about 12 hours. That tank, from the time it went into operation to the present time, has required cleaning at least twice a year and often more frequently. It collects immense volumes of sludge. The scum is a foot thick generally before cleaning, and this is exceedingly foul-smelling stuff, so that it is necessary to deodorize it with lime or something of that sort before it can be handled; and although it is located at a considerable distance out in the country, the nuisance is pretty bad; it is noticeable for a long distance—in fact, was very noticeable a quarter of a mile away.

Moreover, the Red Bank effluent was quite clear and free from suspended matter, while that from Plainfield contained more of such suspended material than one expects to see in a good tank effluent. The analyses of the sewage are not dissimilar, and no reason can be found for the difference, unless it be the fact that the tank mentioned first, having a diameter of 43 feet, has a mean velocity through it of 86 feet a day, and the maximum velocity is not over 100 feet; the other tank is 100 feet long, so that the velocity is over 200 feet per day.

DAWSON'S WARM WATER SUPPLY

Warming the town water supply is what has to be done at Dawson, in the Yukon Territory. The ground is frozen throughout the year, except for the top two or three feet during the summer, and consequently the water in the mains would freeze were not some means taken to prevent it. This preventive consists of turning exhaust steam from the pumps and extra steam from the boilers into the supply, which is thereby warmed sufficiently for the purpose.

Evolution of House Ventilation

The Third Article By E. D. Sidman in Building Management.

The importance of ventilation for all classes of buildings is so well known that it seems unnecessary for us to say anything further on that point, except to emphasize the fact that the value of pure air and the proper amount of humidity cannot be overestimated. A person can live without food or water for several days but deprive him of air for even a few minutes and he is dead. But there is too great a tendency, even among those who consider themselves enlightened, and others who admit the value and necessity of ventilation, to shut out this vital element in its pure state from their buildings, either because, as Benjamin Franklin once said in a letter, "Some people are as much afraid of fresh air as persons with hydrophobia are of fresh water," or they have an idea that ventilation is an apparatus expensive to install and maintain, and requires a skilled person to operate it. In consequence impure dry air, and the absence of ventilation, is the rule rather than the exception in our banks, offices and public buildings, to say nothing of our homes.

Too often, and indeed as a rule, we go to our place of business and earn our daily bread in a foul, debilitating atmosphere, that is not only disagreeable and uncomfortable, but positively injurious to our health. We go to church or the theatre and breathe over and over the foul exhalations of our own and other people's breath, and come away with a feeling of ennui and weariness often accompanied by a headache. We sleep in rooms from which all outside air is excluded, perhaps because there is an old fable that night air is injurious, and do not realize that "no air from without is so unwholesome as the air within the room that has often been breathed and not changed."

Carbacidometer tests made by Prof. S. H. Woodbridge (see Technology Quarterly, Vol. II, No. 2) and others show that there are often six parts of carbon-dioxide to 10,000 parts of air in our offices, public buildings and homes, an exceedingly bad condition of air, bound to be injurious to health, and often leading to fatal results.

Foul Air Undertaker's Friend.

Every year more than 200,000 human beings die of consumption in this country alone, and yet it is a well-known fact that tuberculosis, when not too far advanced, can be and has been cured by proper diet and living an outdoor life, and that the place or climate does not matter as to results, as is proved by the New York State Sanitarium in the Adirondacks, one of the bleakest places in this country, and that of the Royal League in the sunny south. If pure outdoor air will cure this dread disease, why not ventilate your build-

ings and prevent the disease? Dr. Koch, the distinguished bacteriologist, in a paper read before a recent tuberculosis congress in London, England, emphasized the fact that consumption is almost entirely the result of breathing overheated impure dry air, and declared that proper attention to the important subject of ventilation and humidity would practically prevent and greatly contribute to the cure of this dreadful scourge.

Ventilation is not, as many people believe, and as some ventilator makers claim, a blast of air blown in on one side of the room and out through the other side or the ceiling, but as nature intended, a gentle, gradual change of air without perceptible draught in every nook and corner of the room, changing the air often enough to suit the number of occupants and other conditions.

The first step in proper ventilation is to install proper sized and located exhaust vents to carry off the foul and heavier air, as you cannot introduce fresh air into a room unless space is made for it, without using mechanical means and increasing the atmospheric pressure. Repeated carbacidometer tests show that the foul air begins about the breathing line and extends down toward the floor. It is for this reason that a ventilator or opening in the ceiling, or that lowering a window from the top, does not ventilate a room, although both the above will cool a room, which, while desirable in the summer, is very hard on the coal pile in the winter. On account of the above tests it has been found that the proper place for the openings to the exhaust vents is near the floor, preferably just above the baseboard. It is a good idea to also have openings in the exhaust vents near the ceiling for summer use, but they should always be closed when heat is required.

Have Vents Near Floor.

The number and size of these exhaust vents is controlled by the size of the room and the area of the fresh air vents, and should be approximately two-thirds the total area of the fresh air vents in size. In new office buildings each office should have a vent or vents of proper size carried up in the partitions or fireproofing to the attic, where they can be bunched into suitable sized ducts and carried through the roof, in all cases having a vent head on top of them that is proof against down draught; or the vent ducts can be taken off the floor through a register and carried under the floor to vent flues in the halls and thence through the roof. In churches, schools, auditoriums, etc., the exhaust vents should be run in the inner partitions if possible, or, like the Kinloch telephone building in St. Louis, where, in casing the central posts, a space was left between the casing and post for vent flues, with the

best of results. Exhaust vents for residences and flats will be taken up later on.

We now come to the question of how to operate these exhaust vents so as to always have an up draught in them, that will be positive and inexpensive, and where we must decide on the system to be used, whether mechanical (fan), natural (heat) or a combination; therefore a brief discussion of the three systems will be in order.

The plenum or mechanical system depends on a fan for both exhausting the foul air and bringing in the fresh air, and is commonly called the "fan system." While this system is a necessity for mines, shafts, etc., and is used almost exclusively in office buildings for the basement and sub-basements, where a strong draught of air is not objectionable, it has never, for several reasons proven a success throughout an office building; and as most managers and owners were unacquainted with the natural system, this accounts to a great extent for the fact that nearly all office buildings are not ventilated at all above the banking floor. The fan system in nearly all cases is the ideal system for heating and ventilating factories; but, while it is used in many schools, it is not the proper system of heat or ventilation for them; in fact, the manner in which some of them are installed and operated in school buildings is anything but satisfactory. This system has never been adapted for flats or residences.

Different Systems in Use.

The natural system depends upon heat to operate the exhaust vents. The fresh air comes in naturally through small openings distributed throughout the room, which takes the place of the foul air withdrawn through the foul air vents, completely filling the space but without perceptible draught.

The combination system uses a fan to operate the exhaust vents, while the fresh air is brought in by the natural method. The combination system is used for basement ventilation and in offices and buildings where a natural vent flue cannot be used, and also in connection with the aspirating flues in office buildings and schools for use when heat is not necessary. Although we consider this last combination superfluous, as we have never been able to convince the average man that he was cooler in hot weather, in a room with the windows closed and the ventilators working than he was with the windows wide open even when a thermometer in the room showed from 6 to 10 degrees lower than one outside.

The manager or owner, therefore, can use heat in the shape of aspirating stacks or pipes, a fan connected to the top of the exhaust vents or both, to operate the exhaust vents. The expense for installing is slightly in favor of heat, and the expense for maintenance and operation with heat is about 75 per cent. less than with a fan.

A good and inexpensive way to car-

ry off the foul air from an office building where there is no provision made for ventilation, and one which the writer has installed in new as well as old buildings with good success, is to take all the foul air out through the halls, either depending on the opening of the doors from the various offices to vent the rooms (this is a makeshift and not recommended), or through a baseboard into the hall, using the brick casing around the smokestack and the wire shaft for vent flues; the steel stack in the chimney creates a splendid up draught, and by putting a non-down draught vent head over the wire shaft, with a stack of indirects just below the vent head, creates another fine aspirating tube; on each floor install a proper sized register, arranged to close automatically in case of fire, and you have a set of foul air exhaust vents that will do fine work and at practically no expense for operation.

Change Air Every 30 Minutes.

To properly ventilate a room there should be fresh air enough brought in to completely change the air in the room at least every thirty minutes, and in rooms where there are a number of people, or other bad conditions, the fresh air intakes should be able to furnish not less than thirty cubic feet of air per minute for each occupant, and the amount of air necessary in each case should be left to a ventilating engineer to decide, as ventilation can be overdone like everything else, and, when it is, it becomes expensive to maintain. If a fan system is used to furnish the fresh air, the air in all cases should be washed before passing through the tempering coils, and it should enter the room about eight feet above the floor, and at as low a velocity as possible and maintain circulation. If the natural system is used in a new building the fresh air can be brought in in two ways, through direct-indirects, or through sash vents, which have a diffusion box in the room that directs the current upward, thus preventing draught and incidentally it will also keep frost off from the windows. As has been shown, the foul air begins at about the breathing line, so both the above methods diffuse the fresh air where it will do the very most good. The intakes to the direct-indirects and sash vents should have proper hoods so made as to exclude insects and dust, and be easily cleaned. In office buildings already erected, the window ventilator is an ideal apparatus for ventilation, as in a room with two sides it will readily exhaust the foul air as well as furnish the fresh air; in fact, it will do this to a limited extent in a room with windows on one side only, and make conditions much better than no ventilation, but in all cases where possible we should advise exhaust vents.

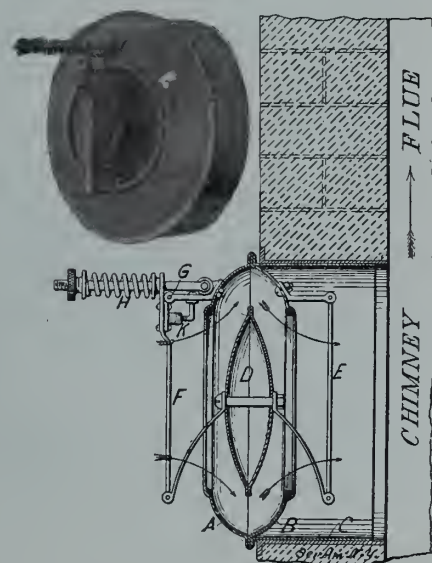
The heating in all the modern office buildings is thermostatically controlled, and easily can be, and should be installed in the older buildings, to prevent overheating, and if washed air

is used with the fan system, or the natural system is used, bringing in the fresh air direct, the humidity will be nearly normal. Any deficiency being easily made up by the use of a knapsack humidifier.

The question is often asked if it does not take more heat and therefore fuel to heat a ventilated building than one that is not. To settle this question there has been made a number of meter tests on steam-heated buildings, and in none of the tests was more steam consumed to heat a building after it was ventilated than before, and in several instances there was a percentage in favor of the ventilated building. It being clearly proved that it is easier to heat fresh live air than foul dry air.

AN IMPROVED DRAFT REGULATOR

A draft regulator has recently been invented which is also adapted for use as a ventilator for inclosed places. The device is automatic in operation for either function and is very sensitive, so



Draft Regulator and Ventilator.

that it will work efficiently under varying conditions of service. The device comprises a shell formed of two sections, A and B, which are essentially concavo-convex, and each section is formed with a large opening in the side. A sleeve, C, projects from one side of the shell, and is adapted to fit into an opening in the chimney or ventilating flue. Mounted centrally within the shell is a damper, D, of double convex form. This damper is supported in place by means of spring arms attached to the opposite plates, E and F. The latter plate is fulcrumed at G on a bracket fastened to the section A. A spring, H, bears against the shorter arm of the plate, F, with a tension which may be adjusted by means of a thumb nut. A buffer, K, is pivoted to the bracket, on which the arm, F, is fulcrumed in such manner that it may be moved into or out of engagement with this arm whenever desired. When the device is used as a draft regulator, the buffer, K, is moved to such position as to bear

against the arm, F, when the damper, D, is centrally disposed in the shell. The spring, H, is then adjusted so as to draw the damper against the opening in the section A of the casing. Now, if the draft in the chimney is increased by variable wind currents, the damper will be moved away from the section A, uncovering the opening therein in a degree proportional to the change of draft, and permit the air to enter the chimney without passing through the fire. When used as a ventilator, the buffer, K, is moved out of active position, and the spring, H, is adjusted to hold the damper centrally in the shell. When the draft increases, the damper will close the opening in the section B. In case the draft becomes reversed, the damper will close the opening in the section A and prevent the entrance of foul air from some other room. The inventor of this device is Jonathan W. Noxon, of 519 Helena avenue, Valley City, North Dakota.

MOISTURE IN BUILDINGS.

Consul W. P. Atwell, in a report from Ghent, Belgium, tells of successful experiments in that city which are interesting as to hygiene of dwelling houses, as well as to the preservation of monuments and public buildings. He writes:

The Ghent city and university libraries were seriously threatened by humidity, and certain parts could no longer be used and had to be completely abandoned. It was, therefore, decided that a trial would be made with a new system of drawing humidity out of walls, which has recently been invented by a Belgian, after long and patient researches. The experiments began July 14 and were completed on August 14. The hygrometrical degree of the air in the room, of approximately 1,200 cubic meters (42,377.3 cubic feet), where the different experiments took place, was 83 degrees on July 13. At that time a strong moldy smell was found to exist. The greater part of the wall was covered with saltpeter, while the floor or pavement was almost continually wet. On September 13, after testing the new system thirty days, the hygrometer was found to have lowered from 83 degrees to 60 degrees. The walls had become completely dry, and the saltpeter and smell had disappeared. The pavement was perfectly dry and remained so, while prior to these experiments it had always been found to be moist. In Belgium the normal hygrometrical atmosphere of buildings in good condition varies between 60 degrees and 70 degrees.

SITUATIONS VACANT.

WANTED—A traveler for Canada, to represent a large Canadian manufacturer; must have acquaintance with wholesale and retail plumbing trade, retail hardware and gas companies; only those who can absolutely fill the requirements need apply. Give references, age, married or single, salary expected. Address Box 684, PLUMBER AND STEAMFITTER, Toronto. (4)

TRAVELER WANTED—For wholesale plumbing supplies, must be a worker, and know the business thoroughly. Central Ontario territory. Apply to Box 706, PLUMBER AND STEAMFITTER, Toronto, giving experience, and where now, or last employed. (7)

NEWS OF THE TRADE IN CANADA

H. Hutton, Toronto, will erect brick houses to the value of \$12,000.

Building permits to the value of \$70,000 were issued at Vancouver during February.

J. Leckie & Co., Vancouver, have taken a permit for a solid brick warehouse, to cost \$80,000.

The congregation of the Lutheran Church, Stratford, have decided to build a new edifice this year.

Hugh Springer, Vancouver, is forming a company to build an apartment house at a cost of \$250,000.

Six new rooms will be added to the Harbord street Collegiate, Toronto, this year, at a cost of \$60,000.

Toronto architects and engineers contemplate the erection of a club house and office building to cost \$500,000.

The Westmoreland Avenue Church, Toronto, recently destroyed by fire, will be rebuilt at a cost of about \$45,000.

The Canada Life Assurance Co. will erect a handsome brick building in Vancouver this year, at a cost of \$250,000.

John McRae and J. J. Culleton, Fort William, have joined forces to open a plumbing and steamfitting establishment at Fort William.

The National Finance Co., Limited, Vancouver, will erect a new three-storey office block at that city. Building operations will start March 1.

The foundry department of the Wolverine Brass Company, Chatham, began operations last week, and, as a result, every branch of the plant is now running.

A church and Sunday school will be erected by the Anglican church at Winnipeg during 1908-09, at a probable expenditure of \$125,000. The proposed edifice provides for classrooms and a first-class gymnasium.

Improvements and extensions to the Halifax post office will be made this year at a cost of between \$50,000 and \$100,000. The plans for the new building have been forwarded from Ottawa and tenders are being advertised for.

Robert H. Meyers, Stratford, Ont., was the only Canadian who attended the third meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers at Chicago on Feb. 10, 11 and 12. The next convention is to be held at Omaha.

A deal for the purchase of a site for Montreal's new technical school is about closed. The Quebec Government is covering the \$200,000 issue of bonds required for the construction and maintenance, and the civic authorities of the city will pay \$15,000 per year towards maintenance.

Chas. B. Childs, who represented Cluff Bros., Toronto, as city traveler, for a year or more, has accepted the agency for the plumbers' brass goods made by the Mann Brass Manufacturing Co., of London, of Toronto, Hamilton and Niagara Peninsula, his headquarters being at 86 Church street, Toronto.

A. H. Lovejoy, Red Bank, N.J., has invented a new heating system for use in any building, the object of the inventor was to provide a heater made in

sections, each of which is practically complete in itself. Any number of sections can be placed together, according to the amount of heat needed.

ONE OF TORONTO'S SHOPS.

Charles E. Pickard, 646 Yonge street, Toronto, whose plumbing and steamfitting establishment is shown in the accompanying engraving, has made the most of the small space at his disposal and the result is the well-arranged store which has been reproduced.

The store is fitted up with hardwood floors and woodwork, is lighted by gas, and heated by hot water and contains a neat show window. The store is bright and attractive and the general impression of tidiness which bears out Mr. Pickard's display has, no doubt, done much to make the business successful.



Chas. E. Pickard's Plumbing Shop at 646 Yonge Street, Toronto.

MONTREAL PLUMBERS' JOLLIFICATION.

The Master Plumbers' Association of Montreal held a most successful euchre and dance at the King's Hall, Montreal. The attendance numbered about 140, and the cards and dancing, not to mention supper, were so much enjoyed that it was with the utmost regret that the party broke up in the small hours of the morning.

The first part of the evening was devoted to euchre, and a keen competition took place for the handsome prizes that were offered. The first ladies' prize, a dozen silver teaspoons in leather case, was won by Miss Butler; the second, a lady's silver-mounted pearl silk umbrella, Miss Robertson; silver-mounted salad dish with spoons, Miss Paterson; cut glass bon-bon dish, Mrs. Watson. The prizes for gentlemen were won by the following: Silver-mounted silk umbrella, W. David; set of silver-mounted carvers in case, J. E. Parker; set of gold pearl cuff links, Mr. Ethier; set of military ebony hair brushes, J. A. Bremner. After euchre, supper was par-

taken of, and then dancing went on merrily until the close.

The committee comprised, John A. Gordon, Jos. Thibeault, J. E. Walsh, Jos. Laurier, P. C. Ogilvie and H. W. Munday. The last-named was indefatigable as secretary, and much of the success of the social was due to his hard work, although he was ably supported by the other members of the committee. It was unanimously agreed that the affair was even more successful than the one last year, and all left the building with the resolve that they would not fail to attend the next one when it comes around. The catering was done by the Cafe Burgess of the King's Hall, under the personal superintendence of G. H. Bradwell, and gave satisfaction to everyone.

FOUNDRYMEN'S CONVENTION.

Active preparations are now being made for the holding of the convention of the American Foundrymen's Association, the Foundry Supply Association

and other allied associations, in Toronto during the second week in June.

Chairmen for the various committees have been chosen, as follows: Convener of Committees, L. L. Anthes, Toronto, vice-president American Foundrymen's Association; Chairman of Entertainment Committee, Fred. Somerville, manager of Somerville Brass Works, Toronto; Chairman Finance Committee, R. J. Cluff, manager King Radiator Co., Toronto; Chairman Grounds and Building Committee, Peter McMichael, manager Dominion Radiator Co., Toronto; Chairman Press, Printing and Programme Committee, W. W. Near, president Page-Hersey Pipe Co., Toronto and Guelph.

It is expected that this will be the largest convention yet held, and Canadian foundrymen will have a splendid chance to study all new foundry equipment, and all the recent developments in foundry practice. The more Canadian foundrymen there are present, the greater will be the success of the convention, and all should make a point of keeping the second week in June open for a visit to the convention.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, March 11.—Business keeps quiet among the supply houses, and manufacturers, in their turn, are not working at any pressure. Orders for spring delivery are away behind those of last year. This does not necessarily mean that the volume of trade done will be proportionately lighter for the year. Manufacturers anticipate a good season, but they are contending against the holding-off disposition of buyers that is being manifested in other industries besides that of plumbing. There seems to be a reluctance to look ahead, with the result that orders which otherwise would have arrived at this time are being kept back. The folly of this course will be apparent later on, when the spring suddenly appears, and everybody will be wanting goods at the same time.

Building prospects appear fairly good. Architects seem to have plenty of work in hand, and as money is circulating more freely, landlords should be in a position to start operations as soon as the ice is out of the ground. Apart from new contracts being placed, there are many contracts still held over from last fall, so that the plumbing trade should be fairly busy when the weather breaks. Local conditions in the plumbing trade at present are about normal. There is plenty of jobbing work going on, and some large contracts are in hand. Things are generally slack prior to the opening out of spring, and this year is proving no exception.

Iron Pipe—The demand is increasing as the season opens out, but there is as yet no volume to the orders being placed. Stocks are well assorted. The new list prices are being maintained.

Soil Pipe—Soil pipe is moving somewhat more freely. This article is about the first to feel the approach of the building season, and the increase in demand is welcomed as a sign of coming improved trade in other directions. Prices are unchanged.

Lead Pipe—Lead pipe is still dull. It is too early for this line to feel the effect of the nearness of the building season. In this respect lead pipe has not the advantage of soil pipe. Lead pipe is still quoted at 20 per cent. off. Traps and bends are the same.

Solder—Solder is practically stagnant. Plumbers seem well supplied for the time being. We continue to quote half-and-half 19c, and wiping 18c.

Enamelware—Orders for spring delivery are still being kept back. There is an improvement in the hulk of those placed, but the volume going out is not so great as it should be. When building starts there will be a heavy rush to contend with. Despite American dumping, domestic lines are holding the demand, and prices are being well maintained.

Brass Goods—Little buying is taking place, even the cutting on inferior articles failing to stimulate the demand. First-class lines maintain their prices, and we still quote standard compression work at 57½ to 60, and fuller work 65 per cent. off list.

Radiators and Boilers—Inquiries are improving for these lines, but it is too early as yet for any decided strength being given to the demand. When the builder has decided to go on with his construction proposition, then these lines will commence to move.

Metals—The tone of the metal market is not strong, although copper is slightly improving under a better domestic demand. Tin has been scarce in New York, a spot premium being created. We quote: Ingot copper, 14½c; ingot tin, \$33; lead, \$4.25; pig iron, \$21.50; for Middlesboro No. 2, \$20.50; Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, March 10.—Trade conditions show an improvement, but at this early date there is very little building doing and though prospects for a good season are bright, goods being shipped at present are for repair work only. Building permits issued since the new year in the Dominion show the number of residences to be built this year to compare favorably with the same period last year. The number of buildings costing upward of \$100,000 throughout the country, however, are very few so far, and though there will be a number of these erected, the total is not expected to equal in value that of last year. Travelers are booking larger orders at present than for some time, and in general trade conditions are satisfactory.

Iron Pipe—A good demand for common sizes is beginning to come in, but as orders are for future delivery the effect on the stocks of local jobbers has not been felt at this date, with a small but steady demand for immediate needs. We quote: One-inch black at \$5.-28 per 100 feet, and one-inch galvanized at \$6.93 per 100 feet.

Soil Pipe and Fittings—After a slight rally, the demand has again quieted down. Stocks throughout the country are in good shape and dealers will be in a position to meet the demand, which should open up in the near future. Prices remain as follows: Medium and extra heavy pipe and fittings, up to six-inch, 70 per cent.; light pipe, 60 per cent, and 7 and 8-inch pipe, 40 per cent. Fittings have been changed to 70 per cent. off list.

Lead Pipe—Small orders for use on repair work are coming to hand in fair numbers. Prices remain firm. We quote lead pipe and waste at 20 per cent. off list. Caulking lead remains at 5½c a pound, and traps and bends are steady at 55 per cent. off list.

Enamelware—Conditions are unchanged and the market is dull, but there is every chance of a good season when business receives a start. There has been no change in prices since the new lists were issued on Jan 20.

Solder—The market is inactive at present, with prices steady. We continue to quote wiping solder at 18c and half-and-half at 19c.

Fittings—Cast iron fittings are firm and a very small demand exists. Stocks are fairly heavy. We quote 35 per cent. on malleable fittings and cast iron 60 per cent.

Radiators and Boilers—Stocks are large at present, with a stagnant market. Since the new lists have been issued prices have been unchanged. We quote 50 and 10 off lists. on boilers and radiators; 55 on hot water; 55 and 2½ on steam, and 50 and 5 on wall; 40 on specials.

Brass Goods—The reductions in prices

made some weeks ago has not stimulated trade to the extent calculated. Fuller work remains at 70 per cent, and standard compression at 60 to 65 per cent. off lists.

FINAL TREATMENT OF SEWAGE.

The treatment of either settled or septic sewage is usually accomplished by means of either sand filtration or by means of coarse grained or rapid filters. Of the latter class of filters there are two general types: the contact bed and the sprinkling filter. Although both are composed of the same materials—a mixture of coarse stone, gravel or coke—and are usually laid out in beds or units their construction and operation are somewhat different.

The contact bed is usually constructed as a tank in which the filtering material of graded sizes is deposited with the coarser material at the bottom. The sewage is run onto the bed until it is full, and is allowed to stand in contact with the filtering material for a definite period of time. During this interval and under the conditions of ample supply of oxygen, the organic matter is rapidly acted upon by the aerobic bacteria until it is oxidized or nitrified, i.e., subjected to the last chemical change or action in the process of decomposition. At the expiration of this time period, ranging usually from two to four hours, the purified liquid is drained from the bed and discharged into the nearest stream or subjected to further treatment.

With the sprinkling filter the construction is almost identical with that of the contact bed, except that the walls surrounding the filter may be omitted. The sewage is, however, applied in a very different way. Instead of flooding the filtering material, the sewage is distributed through nozzles over the beds in the form of spray and allowed to percolate through them to the under drains beneath. In this way a better opportunity is afforded for aeration and nitrification, and results show that not only is the bacterial efficiency of the sprinkling filter higher than that of the contact bed, but that, owing to the better opportunities for oxidation, a large volume of sewage can be purified per unit volume of filtered material.

The effluents from both contact and sprinkling filters, though stable in themselves and generally of satisfactory quality to be discharged into any water course, are, however, not entirely free from suspended matters. Fine, and sometimes rather coarse, particles of the film or coating attached to the stones of the filters which form harboring places for the bacteria while performing their work of nitrification, become dislodged and are carried into the effluent. These particles are mostly stable inert matter, relatively coarse and heavy, and subside quickly when the velocity of the effluent is checked. When it is desirable, then, to remove this suspended matter and secure a clear effluent, it is only necessary to pass the effluent through a settling tank of moderate size and allow the suspended matter to settle out.

The Canada Metal Company, Toronto, are supplying customers with a "coon's" head, which is a good sample of "novelty" advertising. In its normal shape the features bear the appearance of a southern negro, but by pressing the jaws he appears to talk.

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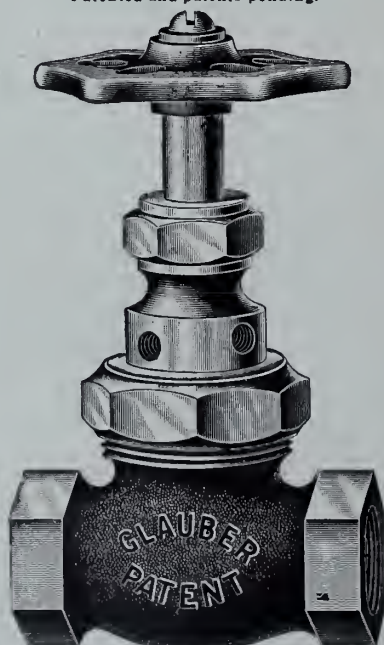
I cannot resist telling you how well I like the **Busy Man's Magazine**. It is the only publication that I keep a file of; in fact I have to because practically every article in the various issues has been blue pencilled by me for future reference.

I have never found under one cover so much that will interest a business man. You have certainly succeeded in obtaining all the articles of value from the principal magazines of the world, and as a consequence I have not only been able to save a great deal of time by reading your magazine, but also a good deal of money. For instance, I had subscribed for 32 different publications. I now find that **Busy Man's Magazine** covers the gist of the majority of them.

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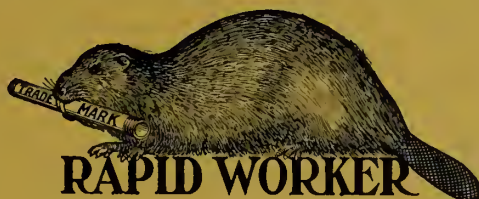
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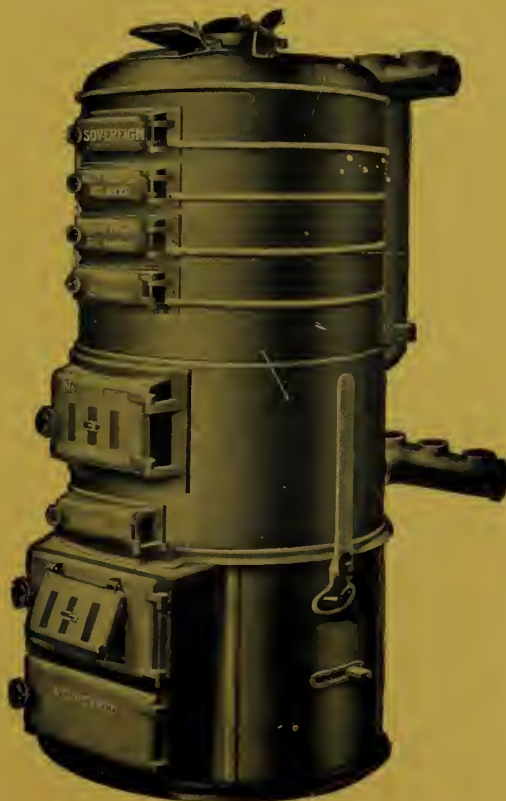
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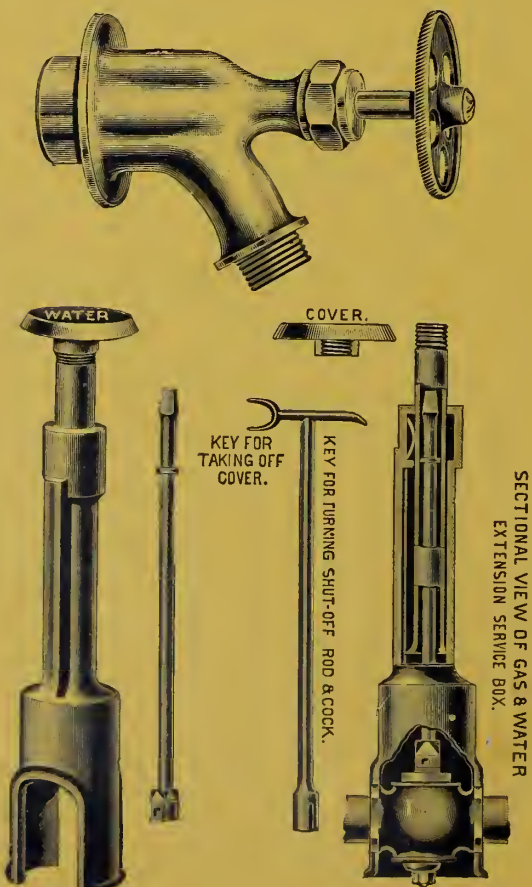
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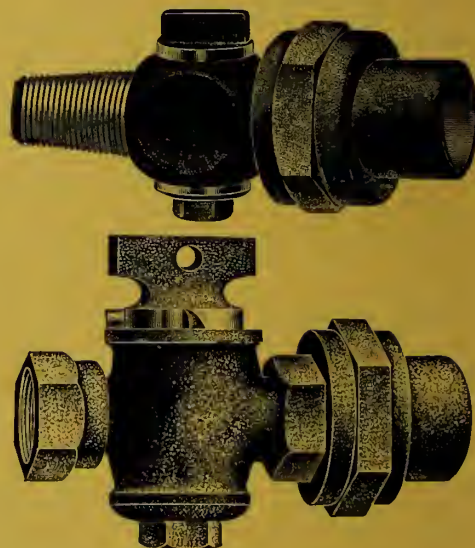
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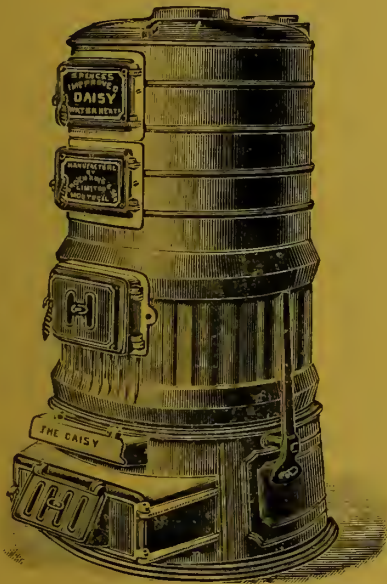
LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 6. (New Series).

Publication Office : 10 Front St. East, TORONTO* MARCH 25, 1908.

Old Series, Vol. XX. No. 6

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is the talk some people use when they try to sell their boilers yet unconsciously they pay a tribute to the DAISY'S WORTH and PRESTIGE.

There is but one Genuine

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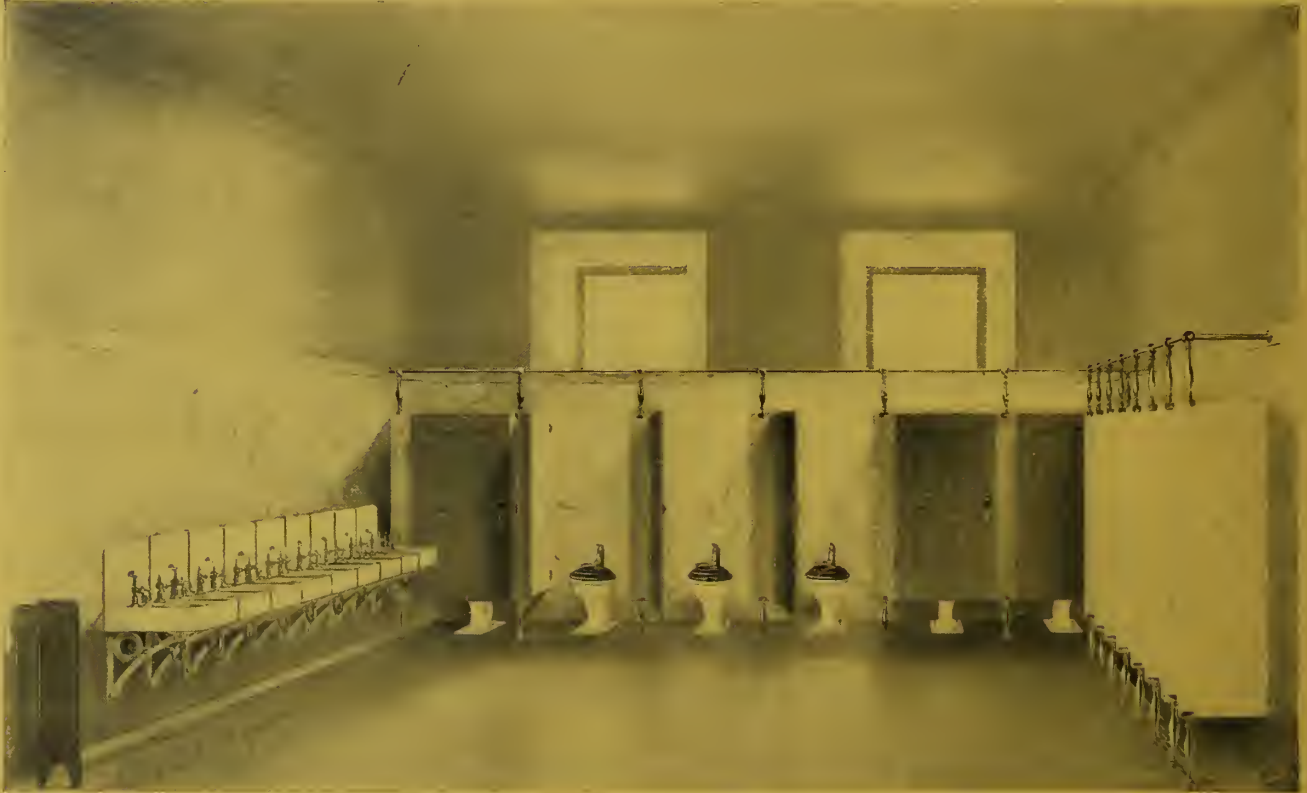


PLATE E—294

The Fixtures used in this interior consist of Six Syphon Jet Closets with Kenny Flushometers, Seven Flat Back Lipped Urinals, Marble Urinal and Closet Stalls, and One Nine-Section Lavatory with Robertson "P" Traps, the entire room lined with Italian Marble.

All styles of Marble Urinals, Closet Compartments, Wainscoting and Wall Lining cut from sketch to order.

The Toilet Room illustrated above is a representative one of many of its kind equipped with our fixtures, and is very handsome and sanitary.

The James Robertson Co., Limited
Toronto and Montreal



Plate 508-E.

Metropolitan Closet

Somerville's Metropolitan Closets are centripetal action syphon jet closets. They have 2-inch N.P. brass flush connections, a square back, Metropolitan seat, panel cover with offset hinges, a serpentine tank with china-tipped push button, $\frac{3}{8}$ -inch I.P. size N.P. brass supply pipe.

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MERIT DID IT.

The pioneer of Hot Water Boilers, whose principles of construction were right to begin with, and are still the standard by which all others must be judged, together with THE QUALITY OF MATERIAL USED, as well as exceptional facilities in manufacturing, have contributed largely to this result and the overwhelming prestige of the Daisy.

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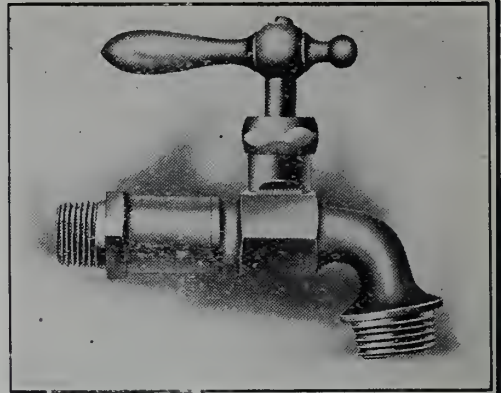
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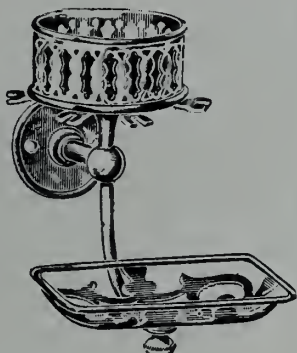


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Will Not Rust.

They are heavily nickel-
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and are designed and
built to wear well.



This is one of the new
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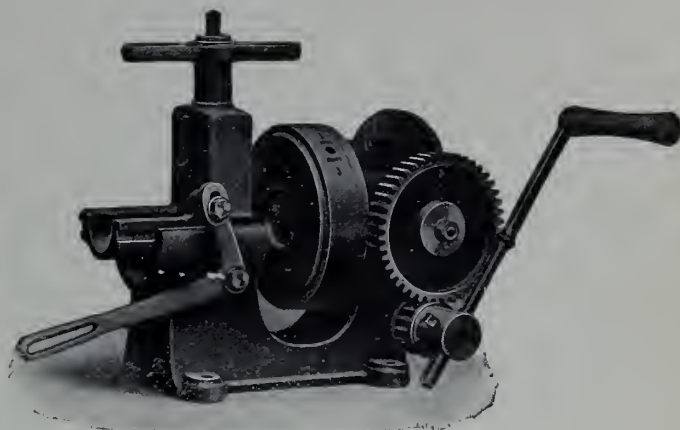
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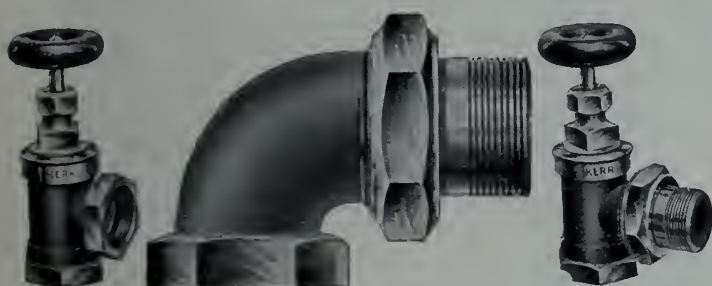
New Model Fig. 1027

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To screw tubes $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ 1 $1\frac{1}{4}$ $1\frac{1}{2}$ $1\frac{3}{4}$ & 2 inch, also Bends $1\frac{1}{2}$ $1\frac{3}{4}$ & 2 inch
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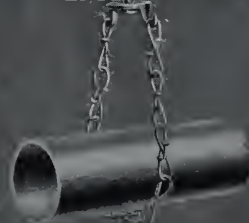
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Pipe may
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TECHNICAL BOOK DEPARTMENT
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Establishing a Plumbing Business

H. A. Justice, in the Metal Worker, gives some Practical Advice to Plumbers or Steamfitters Considering going into Business.

Before starting a business, the investor should give careful consideration to the subject before he invests any money or gives up a good situation. He will undoubtedly find that the view from the outside is much more roseate than a closer acquaintance on the inside will confirm.

The first question to be considered should be whether he is endowed with the qualities that will tend to make him successful as a business man. If possible it would be well to ask the advice of three or four reliable business men well acquainted with the character of the questioner and have them give their candid opinion regarding the qualifications of the prospective business man and the likelihood that he would make a success in a business venture. It is well to reflect that many a first-class mechanic proves to be a failure when he embarks into business for himself and the world is full of men who are popular, bright and capable, and who have hosts of friends, but who have proved failures as business men, and what has happened in the past is more likely to happen in the future, as business methods are every day becoming more strenuous, margins of profits are being narrowed and credits shortened.

Inducements Not Always Scrutinized.

After the question of business ability is settled, the prospective proprietor of an establishment should ask himself why he wants to change, and what inducements are offered to pay him for risking his hard earned savings and incurring the harder work that will fall on him in his new role?

Here is where many men fall into a common error. They say: "If I could make money for Jones, whom I have been employed by for the past ten years surely I can make money for myself." They do not consider that Jones, by the investment of a large amount of capital, the acquaintance of a large number of friends from which to draw trade, by his ability to foresee business conditions months in the future that enables him to buy heavily when prices are low and about to advance, or to buy sparingly when prices are liable to decline, by his organization of the details of his business is able to use each employe in the position in which that employe is most valuable, is able to handle work in a more satisfactory manner than the one man who must attend to all these different things instead of devoting himself to the specialty in which he excels.

Apparent Profits in Labor.

The beginner also figures that if Jones paid him 40 cents an hour for his labor and charged 50 cents an hour for it, Jones had a profit of 10 cents an hour or 80 cents a day on the labor; therefore, if he were working for himself he could work about two hours more a day and would receive \$5 a day instead of his present wages of \$3.20.

In this he fails to take account of the time he will spend in looking over work that he does not get the order for, the time spent estimating, time lost between jobs, printing, rent, repairs on tools, machines, etc., replacing tools lost (a larger item than would commonly be supposed), lost bills, etc.

He should consider all these items, for they will have to be paid, and it is better to face this fact before taking a step that may prove costly.

It may safely be set down as a rule with few exceptions, that the man who has a steady position as a mechanic cannot better his condition by embarking in business for himself unless he has sufficient business ability to secure work enough to keep several men busy and to buy material for his work at reasonable prices and make his collections promptly.

Though it is hard to make the would be beginner believe it, he cannot make

vided the owner of the existing business does not want too much for "good will."

If he is willing to sell out for a reasonable price for his material and machinery, it would be well to buy unless he has had a poor reputation. The amount of business transacted annually and the net profit on it will aid in determining the value of the good will.

Figuring Good Will.

As a suggestion, it might be well to figure that if a business is paying \$3,000 a year net profit, after allowing for depreciation of machinery, stocks, etc., and if a large part of this business comes in because of the past reputation of the proprietor, the "good will" in this instance might be worth to the new proprietor \$1,000 the first year; \$600 the second year; \$300 the third year and \$100 the fourth year, or \$2,000 in all. Naturally he gets the most benefit from it at the start, and this benefit lessens yearly as the memory and former influence of the old proprietor fades from the minds of the old customers and the reputation of the new man increases.

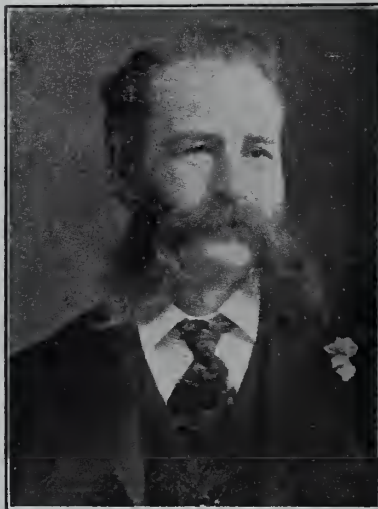
The figures above would not apply to many cases and are only set out as a suggestion. If the former proprietor remained in a position where he could use his personal influence or his business connections in other lines to aid his successor, he might prove of great aid for years.

Shop Must Have Reason to Exist.

If it is not practical to buy out some existing firm the next question to be solved is whether the community offers any inducement for another shop, and if so, what is the inducement. Is there enough work to support another shop? If so, why should another shop be started in preference to enlarging shops already existing? Are their methods bad? Do they turn out poor work? Do they overcharge? Are they dilatory about filling orders? All these questions are going to be asked for prospective customers as well as all the members of the "knockers' club" will ask them, and want to know why the new man is entering the field and, if he has not a good reason for existing, he will not last.

If the field he is acquainted with does not offer good inducements he should try other places, inquire regarding the country, amount of work that is done, the population, number of shops already in business, prices charged and general reputation of those engaged in the same line of business and thus inform himself what chance a stranger would have on coming into such a place.

If he is a tinsmith he can get an idea of whether it is a good place to locate by driving through the town and surrounding country and noting whether the houses have gutters and leaders; by inquiring whether there are creameries and dairies to supply repair work; get-



J. W. HUGHES, MONTREAL.
One of Canada's Oldest Sanitarians
Several Articles From Whose Pen
Will Appear in Early Issues of
The Plumber and Steamfitter.

money if he starts in for himself unless he can depend on getting work enough to pay him \$6 to \$8 per day. It generally takes from six months to a year of experience to teach them this, and in the meantime much has been done to demoralize prices.

Buy An Established Business.

If it is decided to start in business, the next step is to canvass the situation and see what prospects offer for success, which depends largely on the amount of work in the locality and the number of shops already located there. Sometimes some proprietor of a business, because of age, ill health or other matters in which he is interested, desires to dispose of his business and this offers a better opportunity to make a start than starting a new shop, pro-

ting prices on work from existing shops and in other ways that may suggest.

He can get prices by going into shops and asking for quotations on work. It is well to size them up to see if they are properly equipped and well managed for it is a sure shot the new comer will be sized up and well talked about as soon as he starts in business and his competitors will pick him to pieces thoroughly.

The Size of the Town.

Usually a live town of 3,000 to 5,000 inhabitants will support a tinshop and if the surrounding country is well settled and the farmers trade in the town it may support two or three shops, but a town of less than 5,000 inhabitants, if it is not growing, or surrounded by a good country, should be passed by.

Estimating Cost of Work.

It may be added for his information that one of the greatest drawbacks to the business is the inability of many men to estimate accurately the cost of work. Of course, it is hard to estimate the cost of the labor on new work of a special character, but in this case it should be estimated full high and then let the customer go elsewhere if he is not satisfied with the price, for the competitor probably has figured too low, and almost any of us would rather our competitor would lose money on a job than that we should lose it. Besides this, not getting the job that may prove unprofitable, will leave a better chance to handle promptly other work that may come in.

A greater trouble with the estimating is that many men fail to include all the items of cost and expense, or any allowance for waste, "overhead" expense, etc. For instance, if a box of tin costs \$17 they will figure out how many square feet of roof it will lay and will then figure that the above price, divided by the square feet, will give the cost of the tin per foot. In this they entirely ignore the freight and hauling, two items that amount to considerable in the course of a year, even in a small business.

Then some item like charcoal, rails, solder, or some other essential is liable to be omitted in figuring the cost, and probably no allowance is made for waste, which is sure to occur, no matter how competent the mechanics employed. Then a certain amount should be added for cartage of materials and tools to the job and the tools back to the shop, and a percentage added for "overhead" expense, which goes on all the time, whether the shop does business or not. This "overhead" expense is rent, light, fuel, printing, time lost figuring work, making out bills, bad debts, keeping tools in repair, etc., in fact, every item of expense that cannot be charged directly to some job as a part of the cost of that job alone.

More failures are caused by the inability to figure accurately the cost of doing business than any other, and some statements made herein which may seem extravagant will prove in actual practice to be correct. A safe rule in figuring is "When in doubt, raise the estimate." It is better to lose the job than to lose good money.

The Young Man in the Plumbing Business

The present is essentially a young man period. It is not that age is no less respectful and commanding than in times past, but where unusual power and activity are an exception in men of the allotted three score years and ten, those qualities are the rule in the young. It is a time of exceptional opportunity for young men. This being true, says Modern Sanitation, it is wise to think of the part the young man will take in business in the future and to prepare him to take his part well.

The plumbing business, for example, offers a live field for the young man. It is generally agreed that there are defects in the plumbing business which deter it from being as profitable and important as it should be. Time and time again these defects or drawbacks have been the subject of discussion intended to discover ways and means for their elimination. While there is no question but that serious thought and discussion have accomplished much by way of improvement, a happy solution of all the problems seems far distant, and a close student is led to believe that after all other means have been suggested, tried and exhausted, the most logical solution lies within the young man in the plumbing business.

Practical Experience Necessary.

Focus your hope and reliance in the young man, but fit him well for his future. Educate and train him properly. Impart to him the summary of all your business experience, good and bad—the good that he may benefit positively, and the bad negatively, by avoiding all known pitfalls.

Provide him with a proper education, comprising the practical, theoretical and commercial divisions of the business. The omission of a thorough knowledge of any one of these divisions will be a serious loss.

The young man must gain his practical knowledge of plumbing and sanitation in the good old-fashioned way—by actual experience. There is no substitute or better way.

His theoretical knowledge must be gained by study—by the devotion of evening hours to books on plumbing, ventilation and sanitation, supplemented whenever possible by attendance at lectures on those subjects. He should thoroughly familiarize himself with all of the principles underlying his work, and during the day combine his theoretical knowledge with his practical work.

Commercial Course Advisable.

His commercial education, involving the proper method of managing the executive end of the business, can be obtained best by a course in a commercial college—night course if the daytime does not permit—or by personal study and actual contact with the books of his employer. A good business education in a commercial college will prove fully worth whatever expense and sacrifice its acquiring involves.

The duties of the plumber of the future will no doubt be more exacting than they are to-day, for as the science of sanitation is more fully developed, the problems arising will be more varied and complex, and that all such problems may be successfully coped

with, the men who are to meet them should, while they are young, prepare themselves to be successful plumbers and sanitarians.

A "SMOOTH" KICK.

The genial W. H. Meredith, sales manager of the Monarch Brass Co., Toronto, known to every one in the plumbing and fitting trades in Canada, has them all beaten a mile in his original method of registering a kick. William doesn't always sit on the other side of the church to the ladies, as Quakers are wont to do—in fact he's a past master in the art of extending the glad hand and make every one enjoy themselves at social gatherings. But when it comes to handing out a solar plexus blow he has a style that surely originated in Philadelphia, the city of brotherly love. Here's one of his delicious "bon mots" written from Prince Albert, Sask., on March 10:

"I notice in your last two issues that there has been a drop in the position of the Monarch ad. There has not been either a drop in our goods or our prices so that evidently there has been a little oversight on your part. Will look for our regular position in the next issue. We are on top with our goods—put us there with our ad."

ANTI-FREEZING MIXTURES.

The following are rules for avoiding freezing of water in the cylinders, pipes, radiators, etc., of the cooling system. As soon as freezing weather approaches or when the temperature drops as low as 40 degrees Fahrenheit all water should be drained from the radiator, cylinder and pump, and the radiator should be refilled.

1. A mixture of glycerine and water in the proportion, by weight, of 25 per cent. of the former to 70 per cent. of the latter, to which is added 2 per cent. of sodium carbonate.

2. Chemically pure calcium chloride dissolved in hot water in the proportion of four pounds to one gallon of water.

3. Sodium chloride (common salt) or magnesium chloride dissolved in water in the proportion of 1½ to 2 pounds to the gallon.

4. Wood alcohol in the proportion of 20 per cent. alcohol to 80 of water. This solution has the advantage of being sufficient for average winter weather, and it has no ill effect of any kind on metals nor does it leave any sediment.

Should the thermometer reach as low as 15 degrees Fahrenheit a solution of about 25 per cent. alcohol and 75 per cent. water should be used. For temperatures below zero use 30 per cent. alcohol and 70 per cent. water.

Chile offers an extensive field for the plumber and steamfitter. The Government has directed a large number of cities to install sewage and water systems and last year a large amount was spent in some cities. At present the supplies used are imported from United States and Europe but Canadian firms could get a share of this business if they went after it.

PLUMBER AND STEAMFITTER OF CANADA

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THE OUTLOOK FOR BUSINESS.

While 1908 is hardly expected to break any records so far as volume of trade is concerned, the outlook for the plumbing and heating trades is by no means dark. On the contrary, a large and satisfactory business should be done, conditions being favorable for an active building year.

Prior to the financial flurry of last fall everything was at its highest price, not only materials, but labor. "Wages were at the highest point ever reached, and the amount of work done in a day was the lowest ever given," says a leading architect, who goes on to point out that the cost of building was from 20 to 60 per cent. more than a few years ago. This year manufacturers are anxious to sell and workmen exceedingly desirous of securing jobs, so while speculative building will be largely eliminated, innumerable men of average means, who have been deterred from

building owing to the high costs, will now erect houses for themselves.

The return of confidence in Canadian securities is another indication of continued prosperity in Canada. Railroads are spending millions on construction work. Canada's mineral, forest, fisheries and agricultural wealth will all be exploited to the full this year. Tens of thousands of immigrants will continue to pour into the country, and, if we mistake not, many manufacturers will find it necessary to enlarge their plants before 1908 closes, while the beginning of another year will find retailers totaling up 1908 business and finding it compare very favorably with that of 1906 and 1907.

We are in better trim for the storm which broke over us last fall. We have reefed our sails, are steering the business ship a little more into the wind, and are better business navigators than we were a year ago.

PLUMBERS SHOULD ADVERTISE.

Every householder or owner of property in your town and district should know of your ability to install heating and plumbing apparatus. Make the fact known by keeping an attractive shop window and a suggestive show room. A return postal card announcing that you are prepared to overhaul and do repair work promptly at reasonable prices will put you in touch with much new business at a comparatively little expense, while a series of advertisements in your local paper offering free estimates on heating and plumbing requirements will not only bring direct inquiries, but also help to make your business better known.

Such a campaign may not show results in one month, two months, or three months, but, if carefully pursued for six months, it will bring you sure reward for all efforts expended.

The local editor will be glad to help you develop your business by publishing articles encouraging extensions to the water and sewerage systems, pointing out the advantage of modern heating arrangements, not only in public buildings and town residences, but in farm dwellings. The editors of the local newspapers can do much to educate the farmers to do away with the unsanitary out-house and install modern plumbing fixtures connected to windmills for water supply and septic tanks for sewage disposal.

Insert advertisements in your local papers, give the editors pointers regarding possible improvements to prevent disease (and make business for you) and co-operate generally in an educational campaign to improve the unhealthy conditions existing in your locality.

MICHIGAN'S VENTILATION LAW.

A ruling, recently put into effect by the Department of Health of Michigan, amounts practically to a ventilation law, for the time being, at any rate, in that state. The state laws now provide that "before the board of any charitable, penal, educational or reformatory institution shall determine on the plan of any building, or on any system of sewerage, ventilation or heating, * * * such plan shall be submitted to the Board of Correction and the State Board of Health for examination and opinion thereon; and the board so submitting such plan shall, in its biennial report, show to what extent it was approved by the boards so examining them."

Acting on this authority, the State Board of Health has prepared a statement in which are mentioned different designs of heating and ventilating apparatus which it has placed virtually under the ban. Thus, by a process of elimination, a type of heating and ventilating system is secured that not only furnishes an ample supply of fresh air to public school buildings, but to other public buildings as well, which is true of no other state now having a ventilation law on its statute books, with the single exception of Massachusetts. Briefly summarized, the board's statement, which corresponds, in some respects, to the well-known "Form No. 83" in Massachusetts, is as follows:

Direct method of heating is not approved for the reason that it does not provide for the supply of fresh air to the rooms. Indirect method of heating recommended to be used instead. The direct-indirect methods of heating is also disapproved.

Fan method of heating. There are certain rooms in some state buildings, as assembly rooms and laboratories, in which the air can not be changed sufficiently often by natural draft, and for such buildings a forced draft is considered necessary. Plans submitted without special regulation of the air temperature in rooms are disapproved.

The taking of fresh air supplies from basement corridors, or from basement rooms not specially designed for the purpose, is disapproved. It is recommended that fresh air supplies be taken from outside the buildings. Wooden flues are disapproved.

The placing of fresh air and vitiated air registers in the floors of rooms is not approved, nor can the vitiated air registers be located "at any point above the floor line." They must be in the walls at the floor levels. The placing of the vertical ventilating flues in outside walls is not approved.

BURNING COAL WITHOUT SMOKE.

In a very interesting report on "The Burning of Coal Without Smoke in Boilers," by D. T. Randall, which has lately been issued by the United States Geological Survey, the author says:

"The increasing use of gas and coke for domestic manufacturing and power purposes and the centralization of power and heating plants tend to relieve cities of a large percentage of the smoke now given off by small and inefficient heating and power plants. Notwithstanding the fact that other ways of utilizing coal are growing in favor, it will evidently be necessary to burn coal in small boiler plants for some time to come. These coal-burning plants will continue to keep the problem of smoke abatement before the residents of large cities.

"It is recommended that in order to improve the conditions in any city a record of all equipment and furnaces in the power plants be made, and that improvements, methods of operation and the kinds of coal used be made a special study. It is only by such systematic methods that the local problem can be solved, as conditions in any one city are generally different from those in others, depending on the amount and kind of manufacturing and the character of the coal available.

"The personal element is the most difficult obstacle to overcome in the fight against smoke. Study of the requirements and a desire to obtain good results on the part of the firemen will do more to clear the air in cities than any other one influence.

"Being principally the result of an imperfect air supply, smoke can be prevented by providing for sufficient air and for its mixture with the gases in the furnace.

"Well-designed furnaces may smoke to a greater or less degree, depending on the methods of the firemen, the kind or size of the coal, and the rate at which the coal is burned. They may be expected to give smokeless combustion when burning a suitable coal, except under the following unfavorable operating conditions:

"1. When fires are huilt. The furnace not being heated to the required temperature, the gases cool below their ignition point and escape unburned.

"2. When so much coal is burned on the grate that it is impossible to supply sufficient air without frequent poking. This condition usually results in so large a volume of gas from the coal that it cannot be properly mixed with air and burned in the combustion chamber. On reaching the boiler surface it is cooled, combustion is arrested and soot and smoke result.

"3. When the rate of combustion is suddenly increased, as when more coal

is added and fires are poked to get up pressure in short time.

"4. When the fires are checked by closing doors or dampers, thus cutting off the air supply. Banked fires are difficult to maintain and start up without smoke. Automatic dampers are frequently the cause of smoke when not properly adjusted or designed.

"There is need of further study of coals, furnaces and combustion, but enough is now known to enable an engineer to design and operate a steam plant without objectionable smoke."

COLLINWOOD SCHOOL FIRE.

In the opinion of State Fire Marshall Creamer, of Ohio, the disastrous Collinwood school fire, in which scores of innocent children were roasted alive, at Cleveland, Ohio, was caused by an overheated steam pipe which came into contact with wood.

Few people ever think of the danger of wood in buildings being ignited from steam and hot air pipes, but this ignition is not only possible, but it frequently occurs, according to the same authority. The fire marshal has also stated that steam and hot air pipes finally char the wood near them. This charred wood absorbs gases, and this is ignited by subsequent heat as unreasonable as it may seem to the unscientific mind. He recommends that the protection of wood near hot air and steam pipes be as carefully looked after as wood next to a smoke pipe or flue through which the gases from a fire actually pass.

FIRE IN A SKYSCRAPER.

The highest fire in the annals of New York city, and probably in the history of human habitation, occurred recently on the fortieth floor of the almost completed Singer building. The fire is noteworthy, not only for its peculiar origination and spectacular feature, but more particularly so, as it demonstrates the importance and advantages of the use of fireproof materials in the construction of modern skyscrapers. A plumber's furnace, about four feet in diameter and filled with blazing charcoal, was caught in a gust of wind, after it had been left by a workman on the ledge surrounding the cupola.

It is presumed that the wind was so strong that it moved the big pot, and in an instant a shower of sparks shot upward and sputtered against the tower's sides. Around and around swept the blazing embers, some being flung high into the air, others, rounding a corner where the gusts could not reach them, flared up brightly. It took the elements only a few seconds to hammer pieces of the red-hot fuel against the walls and reduce them to myriads of

sparks. Standing out in relief against the darkening sky was the cupola around which the flames could be seen circling the concrete and steel walls as the winds shifted. A few members of the police and fire departments ascended in the elevator and extinguished the flames with the aid of three portable chemical tanks.

An engine at the fire would have been useless, as the streams it might throw would have struck sections of the structure far below where the charcoal was blazing. However, everything the fire could possibly reach in and on the building is made of steel, iron or concrete, and no material on which the flames could feed was near by.

EXAMINATIONS FOR INSPECTORS.

Buffalo, N.Y., has set an example for other cities to follow in having the Civil Service Commission conduct an examination to fill vacancies in the position of assistant inspectors of plumbing, in the office of the plumbing inspector in that city. This is a step in the right direction because better men can be obtained than is possible under political favoritism and it has the added advantage of giving to these men the security of holding office as long as they prove their worth, and not having a constantly changing force every time a different political party controls the city government. It is desirable that this protection should be given to all chief inspectors of plumbing as well, not alone for the benefit of the inspectors but for the interest of the various cities. By such an established rule competent men only would be selected and each year in office would make them more valuable to the city because of the experience gained in theory and practical knowledge in the supervision of plumbing work, and in the administration of the official duties.

Political upheavals every few years bring about certain tenure of office and the breaking in of new men, and it takes a new man a long time to become thoroughly familiar with his duties, before he gives value received.

No city can expect to obtain results in sanitary progress if the inspector is not a progressive man, and free from graft, because once a man stoops to this form of thievery, he places himself in the power of those who do not hesitate to make all manner of improper demands upon him, which lead to exposure later on.

TO POLISH LEAD PIPE.

If it be desired to polish lead pipe, it can be done by scrubbing with powdered pumice and a wet cloth. After scrubbing wipe the pipe dry and polish with a dry cloth. Immediately cover the polished surface with a thin coat of white shellac or white varnish, applied with a brush, which will preserve the polish.

Determining Amount of Radiating Surfaces

Simplified Methods of Estimating Hot Water Radiation—The Last of a Series of Articles on This Subject Written for This Paper by C. E. Oldacre, Toronto.

In calculating the radiating surface required for the heating of any room, apartment, or building there are two quantities that need be first ascertained no matter what may be the method of heating to be used. These quantities are first the heat loss and then the heat that may be supplied per unit of time.

As we have seen, the heat loss takes place through three sources, viz., through the glass, through the walls, and through the change of air in the room. These losses are separated into the three different classes on account of the degree to which they effect these losses

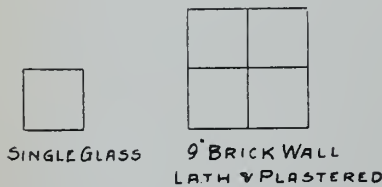


Fig. 1—Relation of Single Glass to 9-in. Brick Wall, Lathed and Plastered.

per unit of their measure. That is, a square foot of glass will effect a greater loss in one hour than a square foot of ordinary wall surface, and a square foot of wall surface will cause a greater heat loss than that which will be carried off by one cubic foot of air. In other words, the quantity of heat that is transmitted through one square foot of glass surface is greater than that transmitted through one square foot of ordinary wall surface, when the temperature is lower on the outside than on the inside of the room, and the amount of heat carried out of the room by the air leaving the room, is less per cubic foot than the cooling that is caused by one square foot of glass or wall surface.

In the light of the modern conception of heat two properties are to be considered, viz., quantity or volume and intensity.

Units of Heat.

The quantity (where English units are used) is measured in British Thermal Units (B.T.U.) and the intensity (the apparent effect) is measured in degrees on the Fahrenheit scale.

In Germany the unit of heat is called a warme-einheit and in France a calorie, and temperature is measured in degrees Centigrade, in which case the German and French unit is equal to practically 4 B.T.U. and the thermometer is graduated from 0 degrees to 100 degrees or from freezing to boiling. This same nomenclature applies wherever the metric system is used.

The unit of heat or British Thermal Unit is the amount of heat that is re-

quired to raise one pound of water from 40 degrees to 41 degrees Fahrenheit or one degree. That is to say, two heat units will raise the temperature of 1 pound of water 2 degrees or 2 pounds of water 1 degree. This holds practically correct up to a temperature of 212 degree. The amount of heat required to raise one pound of water 1 degree will raise the following also 1 degree, viz.:

- 2 lbs. of ice.
- 4½ lbs. of air.
- 8 lbs. of cast iron.
- 11 lbs. of copper.
- 31 lbs. of mercury.
- 32 lbs. of gold.
- 33 lbs. of bismuth.

The calorie, where the centigrade and metric system is used, as is the case with nearly all continental countries, is the quantity of heat that is required to raise one kilogramme (2,204 lbs.) of water 1 degree centigrade or from 4 degrees to 5 degrees centigrade.

Some Early Experiments.

For the purpose of measuring the effect of heat the first thermometer appears to have been constructed by Galileo (born at Pisa, Italy, Feb. 1564, and died Jan. 8, 1642) in 1597. This thermometer depended on the expansion of air. The first spirit or alcohol thermometer was constructed at the Florentine Academy. Mercury began to be used about 1680 for thermometers as it is much more sensitive to heat and cold than either air or alcohol.

Gabriel Daniel Fahrenheit (born in Dantzic, Germany, May 14, 1686, and

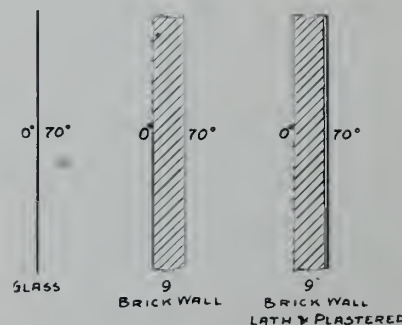


Fig. 2—Relation of Glass and Wall Surface.

died in Holland, Sept. 16, 1736) devised the Fahrenheit scale, using mercury about 1714.

Celsius (Anders Celsius, born at Upsala, Sweden, Nov. 27, 1701, died April 25, 1744) adopted a scale on the metric or centesimal system in 1742, where the boiling point was zero and the freezing point was 100 degrees and Linnaeus (Carolus Linnaeus, born at Ros-

hult, Sweden, May 13, 1707, died Jan. 10, 1778) introduced what is now known as the centigrade system where zero is reckoned as the freezing point of water and 100 degrees the boiling point.

Transmission of Heat.

It is one of the unchangeable laws of nature that there is always a transference of heat from a warm body when surrounded by or in contact with a colder body. This body may be a solid,

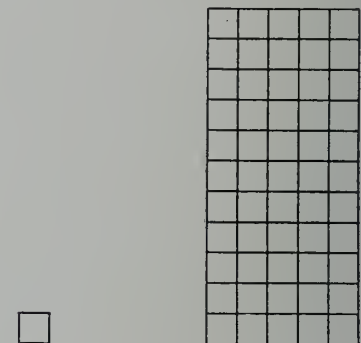


Fig. 3—Relation of Single Glass to Air.

a liquid, air or other gas. The warm body will gradually become colder and the cold body will gradually become warmer until there is an equilibrium established. As an instance of this, we might cite the case of a pail of warm water set exposed in a room. The water will gradually become cooler and the air raised in temperature until eventually both the water and the air assume the same temperature. The heat held by the water has been transferred to the air and when both have the same temperature there is no further transference. The reverse takes place with water that is cooler than the air, as it will gradually take up heat and raise in temperature until it has been raised to the same temperature of the surrounding air.

Another familiar example of the transference of heat from a warm body to a colder body, and the absorption of heat by a cold body from a warmer one is to be seen in the domestic water pipes through a dwelling. If the water is allowed to stand in the pipes for any considerable time, the water in both the hot water and cold water pipes assume approximately the same temperature—that of the surrounding air of the building.

A thorough knowledge of the transference and transmission of heat is quite essential to the complete understanding of the causes and effects of cooling and heating surfaces and their relation to the subject of heating and ventilation.

Three Different Processes.

Heat is a form of motion, and is communicated from one body to another by three known processes which are termed conduction, radiation and convection. Heat is transmitted by conduction when it passes from the hotter to the colder parts of the same body, or from a hot body to a colder body with which it is in contact. A familiar example of conduction is found in the transmission of heat in a bar of metal in the smith's forge, one end of which is in the fire, while the exposed end soon becomes too hot to be held by the bare hand.

Heat is transmitted by radiation when it passes from one point to another without respect to temperature of the medium through which it passes. It is by radiation that we receive our heat from the sun, and it is due to radiation that we feel the effects of an open fire. Radiation is equal in all directions, and the amount of radiation falling on any one area varies inversely as the square of the distance from the radiant body. Some bodies are transparent to radiant rays of heat and vary greatly according to the substance. Bodies that are trans-

rising where the air comes in contact with warmer surfaces. This same cause is what keeps our atmosphere in a very near uniform state of purity, and leads to our trade winds and land and sea breezes.

Rapidity of Cooling.

Newton first enunciated his views on the laws of cooling which was that the cooling was directly proportional to the difference in temperature between the warm body and the surrounding atmosphere. This has later been proved to be practically correct for all ordinary purposes. This means that heat is transmitted 10 times as fast where the inside temperature is 70 degrees and the outside 30 degrees below zero or a difference of 100 degrees, as it will when the outside is 60 degrees and the inside is 70 degrees. This applies of course, to materials of the same nature as different materials vary greatly in their transmitting capacity.

Losses of heat from buildings was first investigated by Peclet and the results of these investigations have been given to the English-speaking engineers through Thomas Box in his "Practical Treatise on Heat." Later, investigations made by the German Government and which have been brought to the notice of the English-speaking public through Prof. J. H. Kinealy in "Formulas and Tables for Heating" are today considered the most correct constants. The transmitting effect for various materials reduced to English measure has been given in Table XI. and Table XIII. from Kinealy's work.

How Winds Affect Heating.

As all building construction is more or less porous, buildings which are exposed to winds require more heat than those more protected, and the greater this protection, the less the amount of heat that will be required to produce any required temperature. This also applies to the various rooms of a house or building, those on the windward side requiring a greater amount of heat than those on the protected side. The direction of the exposure and the intensity of the winds also affect the leakage that occurs around windows and doors.

As we have seen, the heating and cooling of rooms depend on three factors, the glass surface, the wall surface and the number of times the air is changed per unit of time. The relations of these factors have been determined with fair accuracy in the light of modern investigations, and as the proportions of glass surface, wall surface and cubical contents have varying relations, it is quite necessary to determine the loss from each, in order to properly proportion the amount of heating surface that may be required to maintain any given temperature.

Practical Illustrations.

In Fig. 1 is shown two squares, the small one representing single glass, and the one 4 times as large represents a surface of wall of ordinary brick construction, one brick thick (9 inches), with stripping which provides an inch air space over which there is wood lath,

and plaster. The glass will transmit 1.03 (or practically one heat unit) B.T.U. per hour per degree of difference in temperature between the inside and outside air per square foot. That is, with an outside temperature of 10 degrees below zero and an inside temperature of 70 degrees or a total difference in temperature of 80 degrees the heat loss from one square foot of glass in one hour would be 80×1 B.T.U. or 80 B.T.U. As the loss from the wall surface is only practically one-fourth of what it is from an equal area of glass under the same conditions we readily see that it requires a wall surface of four times the area of the glass surface to produce the same heat loss, or cooling effect.

Fig. 2 shows a single glass surface, a bare 9-inch brick wall, and a lath and plastered brick wall or ordinary brick building.

By referring to tables previously given we find the heat loss from these are 1.0348, and 0.23 B.T.U. per hour, per degree of difference in temperature between the inside and outside tempera-

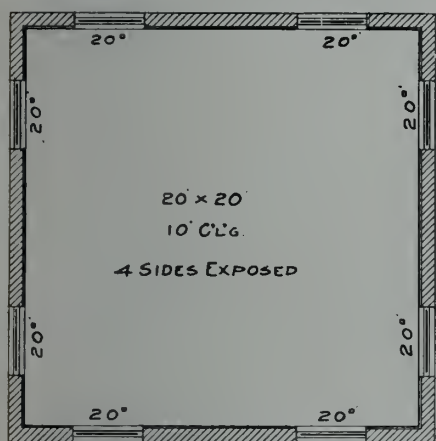


Fig. 4.

parent to heat are called diathermons. Crystals of rock salt are practically transparent to heat radiation. Wood and felt, which are poor conductors, are also opaque to heat rays.

Liquid bodies and gaseous bodies are set in motion by heat and the rubbing contact takes up more or less heat. This is known as convection. The heating and cooling of the air of rooms is practically accomplished through the moving currents of air which come in contact with the various heating surfaces and the walls of the rooms.

Air and Water Poor Conductors.

Air and water are both poor conductors of heat. If a body of water is heated at its top only the heat will not be conducted to the bottom of the vessel except very slowly, but immediately heat at the bottom is applied convection takes place and heated currents are carried to the top and other and colder water takes its place, due to the greater weight of the colder water.

Due to the same cause the air of our rooms is kept in constant circulation, the air falling along the colder walls and

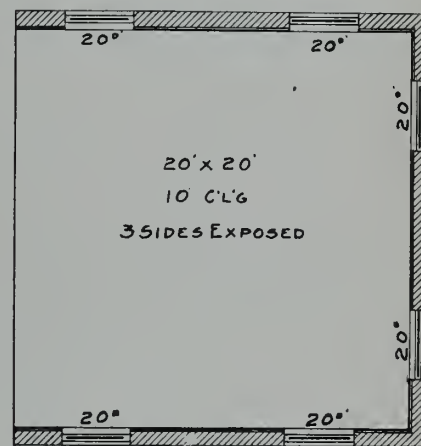


Fig. 5.

ture, per square foot of surface. For example, we will examine into the heat loss that would be occasioned through 100 square of each with an inside temperature of 70 degrees Fahrenheit and an outside temperature of zero. The glass surface would then give a total heat loss of $100 \times 1 \times 70 = 7,000$ B.T.U., the bare brick wall $100 \times 0.348 \times 70 = 2,436$ B.T.U. and the stripped, lathed and plastered wall $100 \times 0.23 \times 70 = 1,610$ B.T.U. In practice this factor is usually taken at 0.25 from which the method of dividing the wall surface by 4 in order to reduce the wall surface to equivalent glass surface.

All Cases Not Alike.

This illustration also shows the necessity of using different constants for the heat loss, according to the thickness and nature of different walls; thin walls giving a much greater loss per unit of area than thick walls of the same material, and bare walls showing a greater loss than those that are stripped, lathed and plastered.

Fig. 3 shows the relation of glass surface to change of air that takes place

in a room. It shows that one square foot of glass surface loses the same amount of heat in one hour or has the same cooling effect, as is carried away by 55 cubic feet of air under the same temperature conditions. It has been determined that the thickness of glass, within the range of ordinary commercial thickness, makes very little or no difference in the cooling effect, that is plate glass, transmits the same quantity of heat as window glass. By referring to the tables we note that a double window has about one-half the cooling effect of single glass but this does not strictly apply unless the space between the two glass surfaces is absolutely tight which is not often the case in practice.

Figs. 4, 5, 6 and 7 show 4 rooms, each 20x20 feet with 10-foot ceiling with varying exposures. Where the walls are not exposed outside walls it is to be presumed that they are assumed to be partitions between adjoining rooms that are heated to 70 degrees and consequently have no cooling effect.

In Fig. 4 we have 640 square feet of wall surface, 160 square feet of glass

For the room shown in Fig. 7 the calculations would be made as follows:

Glass surface $40 \times 70 \times 1 = 2,800$
 Wall surface $160 \times 70 \times .25 = 2,800$
 Cubic contents . $(4,000 \div 55) \times 1 \times 70 = 5,407$
 11,007

In this last case only one change of air has been calculated.

Where outside temperatures of 10 above, 10 below 20 below and 30 below zero Fahrenheit are to be had the multiplier, instead of 70 would be 60, 80, 90 and 100 respectively when 70 degrees Fahrenheit is the inside temperature to be maintained. Otherwise the multiplier is the difference between the lowest determined outside temperature and the required inside temperature, as for example, if the outside temperature is 20 degrees below zero and the inside temperature is 60 degrees above zero, then the multiplier would be 80, or if the outside temperature is 10 degrees above zero and the inside 65 degrees above, then 55 would be the multiplier.

Ratio of Heating Surfaces.

Using the above heat losses, and the conservative figures of 250 heat units as the heat emitted by steam radiators and 150 heat units by hot water radiators per hour we would have as the required square feet of heating surface the following:

Steam.	Hot water.
$33,215 \div 250 = 132$	$33,215 \div 150 = 221$
$27,615 \div 250 = 110$	$27,615 \div 150 = 184$
$22,015 \div 250 = 88$	$22,015 \div 150 = 146$
$11,007 \div 250 = 44$	$11,007 \div 150 = 73$

The relation of the various proportions of heating surface to cubic contents would be.

	Steam.	Hot water
Figure 4	1:30	1:18
Figure 5	1:36.4	1:21.7
Figure 6	1:46	1:28
Figure 7	1:92	1:55

The above clearly shows the varying proportions of heating surface to cubic contents and how necessary it is to consider the glass and wall surface and air changes in making any calculations to determine the amount of heating surface required to maintain any given temperature.

In the above no allowance has been made for wind exposure or intermittent heating which would need be done in practice as has been previously explained.

In the foregoing it has been assumed that, in the cases spoken of, the buildings are fairly well built or on the average, with good, fair workmanship. Of course, if there are loose windows and the buildings or parts of the building, are of poor construction a greater proportion of heating surface will be required, but the experienced person will readily detect such conditions and make due allowances by adding such necessary surface. The proportioning of radiation for large buildings or large spaces has not been specifically touched on, particularly by examples, but the same factors and rules that have been

set forth, apply just as well to large spaces as to more moderate sized ones, always keeping in view the nature of the construction of the building, together with the thickness of walls and the purposes for which it is intended to be used.

Though it is not hardly within the province of this work it may be not amiss to point out that it is essential that a boiler of ample size shall always be chosen and with particular reference to temperature to be maintained and the heat emission value of the radiating surfaces, that is, radiators cool quicker in rooms at low temperature than high temperatures and that pipe coils and wall radiators have a cooling or condensing effect of from 20 to 33.3 per cent. greater than ordinary standard radiation and boilers must be selected accordingly.

Good judgment is essential in the application of any rule or rules for the proper proportioning of the quantities of radiating surfaces and it has been the endeavor to thoroughly set forth as clearly and as plainly as possible each and every component factor entering

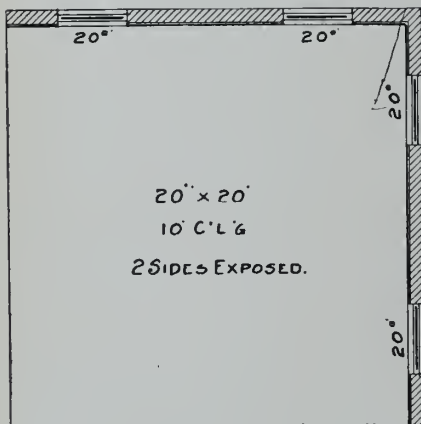


Fig. 6.

surface and 4,000 cubic feet of contents, which, with two changes of air per hour would mean 8,000 cubic feet of air passing through the room. With 70 degrees inside and zero outside, the total heat loss in this case would be:

Glass surface $160 \times 70 \times 1 = 11,200$
 Wall surface $640 \times 70 \times .25 = 11,200$
 Cubic contents . $(4,000 \div 55) \times 2 \times 70 = 10,815$

Total heat loss 33,215

In Fig. 5 the heat loss would be calculated as follows:

Glass surface $120 \times 70 \times 1 = 8,400$
 Wall surface $480 \times 70 \times .25 = 8,400$
 Cubic contents . $(4,000 \div 55) \times 2 \times 70 = 10,815$

Total heat loss 27,615

In the case of the room shown in Fig. 6 the heat loss would be calculated as follows:

Glass surface $80 \times 70 \times 1 = 5,600$
 Wall surface $320 \times 70 \times .25 = 5,600$
 Cubic contents . $(4,000 \div 55) \times 2 \times 70 = 10,815$

Total heat loss 22,015

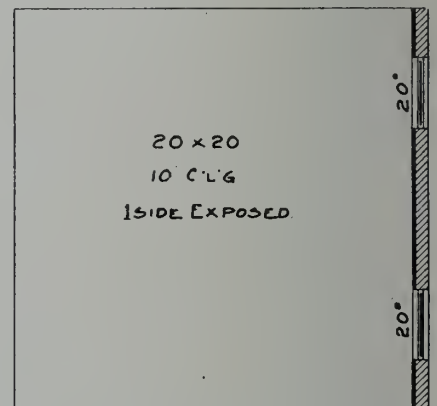


Fig. 7.

into the question of determining the required heating surface for any particular kind of work.

REMOVING PAINT FROM RADIATORS.

"F. V. D.," Brandon, Manitoba, asks how to remove elastic carbon paint from hot water wall radiators without taking the radiators from their position and putting them through a process of heating. The radiation is in a conservatory and their customer believes that the tar in the paint is affecting the plants. If any reader of The Plumber and Steamfitter can suggest any other method than heating we will be glad to hear from them.

Dr. J. Brown has drawn attention to the usefulness of muslin curtains in filtering the air of rooms. The amount of solid matter removed from the air by muslin window curtains has surprised him. As he says, they are cheap and easily washed, and should be changed frequently. One condition he advocates, but does not insist on, is that they should not be dressed or ironed.

A Problem of Ventilation

An Interesting Query Made by a Plumber in a Western Canada Town Where Plumbing Regulations Have Recently Been Put Into Force.

The cottage shown in the accompanying sketch, forwarded by a western reader of The Plumber and Steamfitter, has been in existence for some years, and now has to have plumbing put in to comply with the local by-laws. The owners of the cottage asked the plumber to give a price for installing the plumbing and then asked the carpenter to confer with the plumber as to the amount of carpenter work required to suit the needs of the sanitary authorities. They went together and looked over the place and decided that in division 2 a door be placed with a space of 2 inches left underneath for ventilation, the plumber figured on putting a six inch galvanized iron vent pipe from the ceiling through the attic to the roof. The door at "a" to remain as it was, the closet entrance at "3" to be boarded up with double boards papered between with building paper, and a window 12 x 14

point, and would surely prove unsatisfactory in operation.

The closet should be back vented, and the local vent should be carried to a chimney or warm flue to induce an upward current of air at all times. This vent should not be less than 3 inches in diameter. As shown there would be every opportunity for a back current down the 6 inch vent pipe at times. This would be very likely noticeable at times when the temperature was higher outside than inside.

We are unacquainted with the local by-laws, but say unhesitatingly that provision should be made that no closets or urinals should be allowed in inside rooms, wholly surrounded by other rooms and that each and all of such rooms should have a side window of

tion increases in density, the danger from the inobservance of such simple regulations multiplies many fold.

We would be pleased to hear from our readers on this topic, as well as any others of interest to the plumbing and steamfitting trade, to the full discussion of which the columns of Plumber and Steamfitter are always open.

DECIDED TO STAY SINGLE.

A muscular Irishman strolled into the Civil Service examination-room, where candidates for the police force are put to a physical test.

"Strip," ordered the police surgeon.

"What's that?" demanded the uninitiated.

"Get your clothes off, and be quick about it," said the doctor.

The Irishman disrobed, and permitted the doctor to measure his chest and legs and to pound his back.

"Hop over this bar," ordered the doctor.

The man did his best, landing on his back.

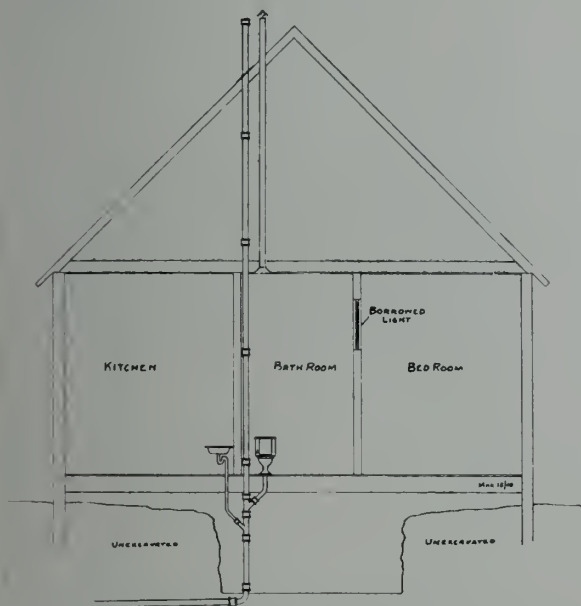


Fig. 1—Side View of Cottage.

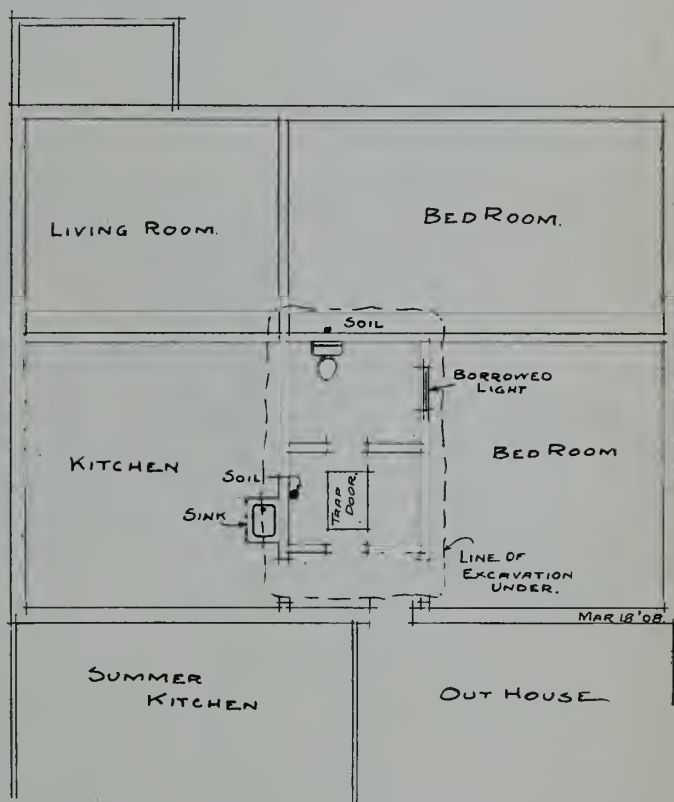


Fig. 2—Floor Plan Showing Enclosed W.C. in Western Town.

inches placed for borrowing light from an adjoining bedroom.

The work was gone on with, but the sanitary inspector came on the scene and condemned the whole arrangement. Partition (1) is to have a fanlight, placed on hinges above the door. Partition (2) is to have the space above the door left entirely open, while no provision is made for ventilation under the doorway.

Under what conditions is the well from this closet, while in use, least likely to get back into the house?

Either arrangement shown or referred to by our correspondent would be objectionable from a sanitary stand-

not less than 6 square feet in area (2 ft. x 3 ft. or its equivalent) leading to the outside, and looking to the welfare of the present as well as the future, no latitude should be given to old or new structures requiring such fixtures. This avoids many tendencies to evade necessary sanitary regulations and once and for all closes the door to such evasions.

Fresh air and light are the natural enemies, as common sense and science has proved, of unsanitary conditions. These health giving elements of nature cost nothing and should be taken advantage of, even if compulsion is necessary to enforce their use freely. The seeming inconvenience and expense to the few for the temporary time is nothing as compared to the benefits to the many of a growing town or city. As the popula-

"Now double up your knees and touch the floor with your hands."

He sprawled, face downward, on the floor. He was indignant, but silent.

"Jump under that cold shower," ordered the doctor.

"Sure, that's funny!" muttered the applicant.

"Now run around the room ten times to test your heart and wind," directed the doctor.

The candidate rebelled. "I'll not. I'll stay single."

"Single?" asked the doctor, surprised.

"Sure," said the Irishman, "what's all this fussing got to do with a marriage license?"

He had strayed into the wrong bureau.

One Pipe Steam Heating Systems

E. H. Roberts Describes a System Installed in a Bank Building and W. H. Helliwell Suggests What he Considers a Better Method of Making the Connections.

As there are limitations to the practicability of furnace heating, so there are to hot water heating as well. Theoretically, hot water heat can be adapted to almost any building and there are central hot water plants that satisfactorily supply heat to scores of houses, but in large, high buildings the pressure of the water is often so great as to make it impossible to prevent the boiler and pipes from leaking. It is also a difficult matter to secure anything like an even temperature of the water through long mains and a complex system of radiators without keeping the water under a high pressure.

Water boils at a temperature of 212 degrees Fahrenheit and, therefore, the water in an open tank hot water system must necessarily be carried at a somewhat lower temperature. Ordinarily 180 degrees is considered the most satisfactory maximum and this is the tem-

water system, steam radiation is much more efficient than hot water radiation.

Advantages of Steam.

The advantages of steam may be briefly summed up as follows; First, it circulates much more rapidly than hot water and can be adapted for all classes of buildings from the largest to the smallest—second, it requires less piping, less radiation, less labor for installation and is, therefore, cheaper than hot water heat.

But, although steam is so universally

required there more than perhaps two or three times in a week, and then only during the evening.

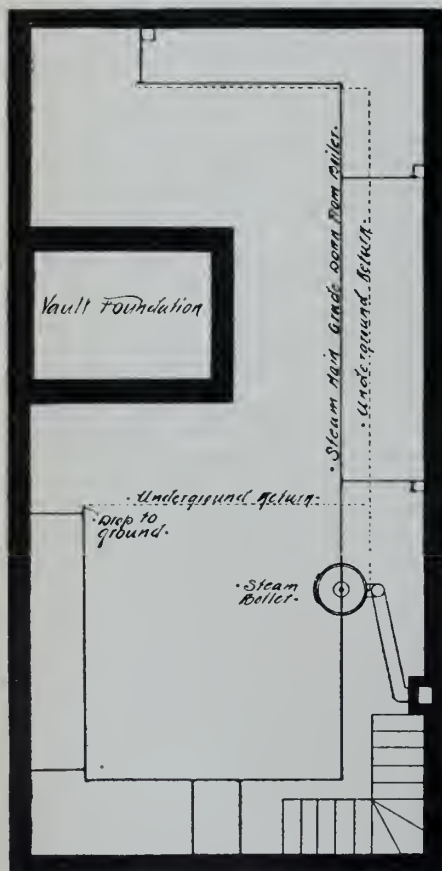
Hot Water Not Satisfactory Here.

It seems clear that hot water would not be satisfactory here, for, on account of the by-passes in the hot water radiator valves, so arranged to avoid danger from freezing, the upper part of the building would be moderately heated just as long as the heating plant was in operation. Steam, however, can be closed off from any radiator or the entire second floor without danger, and moreover, the lodge room and reception room can be heated, whenever heat is wanted, in less than one-fourth the time with steam that would be required to accomplish this result with hot water.

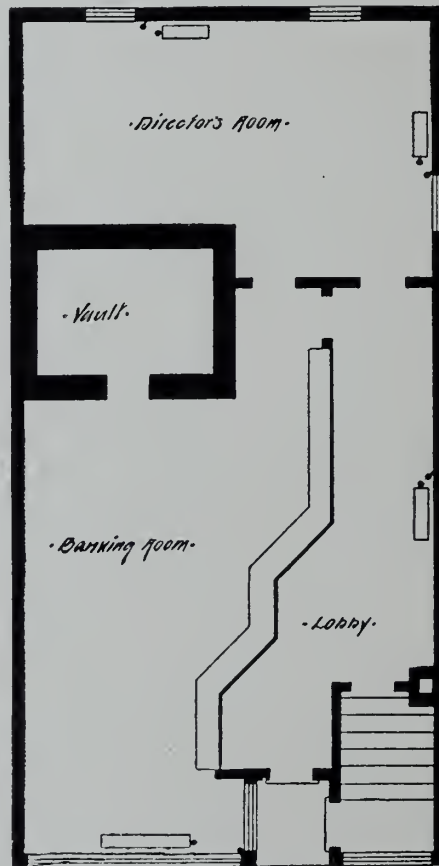
The Basement Plan.

Now, referring to the accompanying basement plan, you will notice that the boiler is located quite near the chimney, for with steam particularly a strong fire is necessary in order to raise steam quickly. The boiler shown is of the round type and has a single steam outlet directly at the top.

Unlike hot water, steam mains should be graded down from the boiler so that the condensation will travel with the



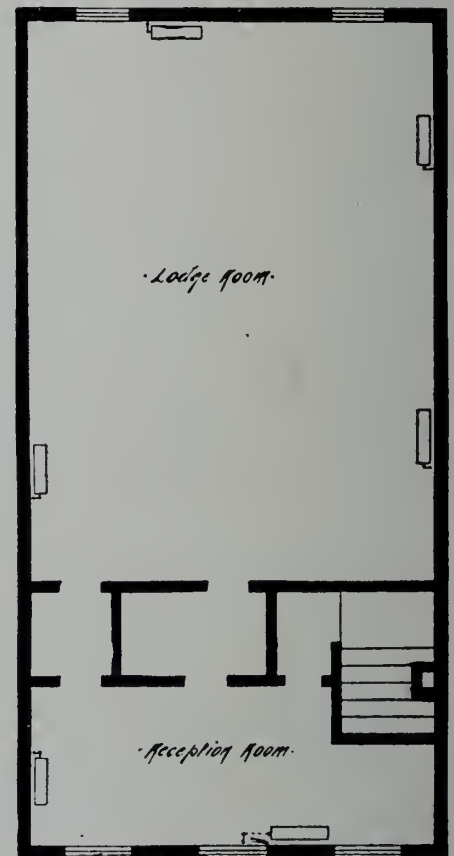
Basement Plan.



First Floor Plan.

possible and considerably cheaper than hot water, it does not necessarily follow that it is the ideal heat for all buildings. There are buildings which can be heated better and more economically with warm air than with any other system, in some hot water is the preferable and logical heat and then there are a very large class of buildings in which it is better to use steam.

Take this bank building as an example. The first floor will be used continually with the exception of Sundays and holidays, but the second floor is to be used as a lodge room and no heat is



Second Floor Plan.

steam instead of against it. The old practice was to grade steam pipes from the boiler and this usually resulted in much pounding and hammering caused by the water working back against the steam.

perature on which most rules for estimating water radiation are based.

Steam, on the other hand, does not form until the water in the boiler has reached the boiling point, and being so much hotter than the water in a hot

Danger of Pounding Reduced.

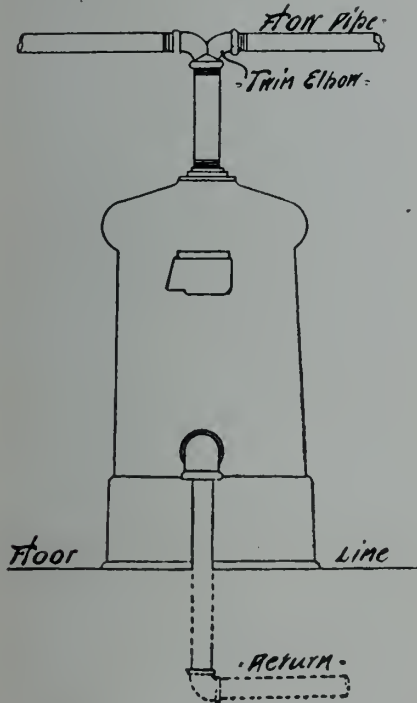
Of course, in a one-pipe steam job such as we are studying, it is necessary to grade the branches up from the mains in order to draw the condensation back, but the danger of pounding as a result of friction between the steam and returning water may be greatly reduced, if not entirely eliminated, by making the horizontal arms of one size larger pipe than the connecting riser.

For example, if the radiator for which the branch is made requires a $1\frac{1}{4}$ inch pipe, it would be proper to use a $1\frac{1}{2}$ inch horizontal branch in basement. It is also advisable to make these horizontal branches as short as possible. Some fitters do not advocate branches longer than five feet, except, perhaps, near boiler, where the amount of condensation will be very small.

Usually a steam plant is laid out with two mains running in opposite directions around the building, as two comparatively short steam mains are preferable to one long one unless several returns or bleeders, as they are called, are used to separate the water from the steam.

The Steam Plant

The steam plant shown here has two mains and at the extreme end of each the pipe drops to the floor and runs



underground, as indicated by dotted lines, to connect with the return opening at the back of the boiler. These returns should be considerably smaller than the steam mains as the volume of condensed steam is small as compared with steam in its original state.

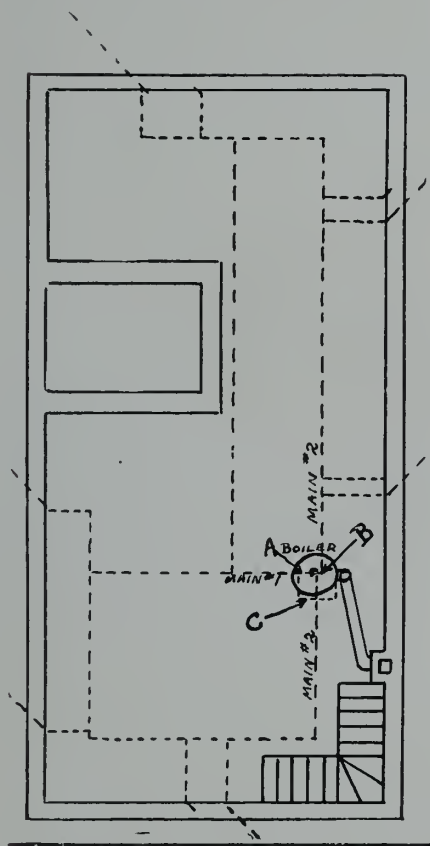
It is not necessary to run the returns underground, but if they are below the water line of the boiler there is less danger of the water from the boiler being forced out, either through the steam outlet or the return opening.

Space does not permit us to explain every detail of work for installing a steam plant of this kind, but enough has been said to enable anyone of a mechanical turn of mind to grasp the essential principles.

BETTER METHOD SUGGESTED.

"On page 54 of Hardware and Metal, Feb. 22, there was an article by E. H. Roberts (reproduced above) on the steam heating of a building," writes W. H. Helliwell, manager of the Gurney Foundry Company, Winnipeg, who recently described a one pipe steam system in The Plumber and Steamfitter, the return being brought into the top of the boiler. He adds:

"We have installed in our own new six storey warehouse here a one pipe steam system, similar in construction to the one I described in The Plumber



Rearranged Basement Piping System.

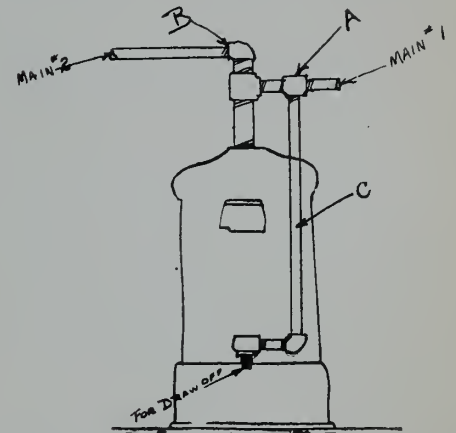
and Steamfitter of Sept. 11, 1907, and a better working job I never saw in my life. It is absolutely noiseless under all conditions from starting it at stone cold to running it at twenty pounds pressure. We have never heard a knock or a single sound of any sort or description, and the way it circulates and works is really marvellous.

"A system was installed in another building here a while ago very similar to the long underground return job described by Mr. Roberts in his article. The system here was far from satisfactory and the writer, with the steamfitter, went to the job and changed it round by cutting out the long, underground return entirely, and feeding it from both ends in a similar way to the system I have already described. The result was astonishing, it worked most

satisfactorily and saved from twenty-five to thirty per cent. in fuel.

"Now one of the great objections to the underground return in the writer's mind is that the water in that return moves very slowly indeed and practically returns to the boiler cold. At the same time you have a lot of dead water to all intents and purposes lying in your return pipe.

"I have taken the liberty of suggesting a change in Mr. Roberts' plan, and herewith enclose a rough drawing illustrating same. "B" is the highest point in the system, and "A" is the lowest point. "C" is a relief pipe taken off just



Rearranged Boiler Connections.

before the return pipe comes back to the boiler. With this system there are no dead ends and instead of having a tremendous amount of cold water returning to your boiler you have just the small amount from "C" which only extends from the water line to the bottom of the boiler, and this is coming in almost at a temperature of 212 degrees. I do not wish for one minute to criticize Mr. Roberts' lay out, because it will work all right. There is not the slightest doubt of that, but it can be improved on in the way I have mentioned.

"I wish The Plumber and Steamfitter all sorts of luck and prosperity."

BOOK REVIEW.

Practical Steam and Hot Water Heating and Ventilation is the title of a new work of 402 pages by Alfred G. King, published by the Norman W. Henley Co., New York.

Mr. King's book is designed to give all the necessary information to the beginner in heating and ventilating engineering, as well as some points that will be read with profit by the more experienced engineer. The book is handsomely printed on coated paper and the illustrations have been prepared with care and are unusually well executed. It is intended for the practical man and for that reason the more scientific aspects of the art are carefully avoided. An entire chapter at the end of the book is taken up with rules, tables and similar information which form a complete and useful reference. There is also a full index. The book can be secured in Canada through the technical book department of the MacLean Publishing Company, Toronto.

NEWS OF THE TRADE IN CANADA

The plumbing work of the new post office at Regina is being executed by Cook, Potts & Smith, of that city.

Tenders are being called for the erection of public buildings at Renfrew, including a post office, customs office and weights and measures departments.

Bell & McGown have opened a plumbing and steamfitting business at Vernon, B.C. The men were formerly employed by the Vernon Hardware Co.

Portage la Prairie, Man., has decided to proceed with the proposed auxiliary system of waterworks, according to plans drawn up by Engineer Chipman, of Toronto.

Minnedosa, Man., expects soon to have a waterworks and power system combined, and an electric plant of not less than 600 h.p. may be erected in the near future.

The Western Plumbing and Heating Co., Saskatoon, have purchased property in that city and will erect a two storey office and warehouse building during the season.

T. P. Calkin & Co., Kentville, N.S., have opened a store to carry on business as plumbers, heating and sheet metal workers. The manager of the new concern is Lewis G. Ellis.

The Regina Plumbing & Heating Co. recently installed a new steam heating plant in the residence of the lieutenant-governor of Saskatchewan in a way which is highly creditable to this well known firm. They have also received orders to overhaul the entire plumbing arrangements of this large residence.

Whiteford Brothers, Regina, have already secured several contracts for plumbing and heating installations both in new houses, and in some which have not had these modern conveniences previously installed. They anticipate that in regard to plumbing the season about to commence will be as large as in 1907.

Among the buildings in contemplation this year is a chapel for the Sisters of St. Joseph, to cost about \$25,000, and an addition to St. Joseph's Hospital, London, to cost about \$10,000. These and other projected buildings, including the isolation hospital, the hygienic institute indicate that the approaching season will be a busy one.

J. Liveck, formerly of Thompson & Liveck, master plumbers, Ottawa, has joined forces with A. H. Currie, master plumber, and the new firm have located in Thompson & Liveck's old stand at 104 Bank Street, Mr. Currie closing his shop at 775 Bank Street. Both of the above named gentlemen are experts in their particular lines and their many friends will wish the new firm prosperity.

Chatham plumbers came in for some compliments at the hands of the city water commissioners recently when the licenses were renewed for the current year. One new license was granted, to Campbell & Callahan, tinsmiths, the licenses renewed being those of Westman Bros., T. W. N. Clements, James Watt & Sons, C. R. Bowers, J. C. Wanless, R. McG. Coyle, J. H. James and John McKay. The list has grown much in the last few years.

The Builders' and Contractors' exhibition, which is to be held in Montreal in April, promises to be one of the most successful of the Canadian trade exhibitions that have been held. The Master Painters' Association will supervise the exhibits connected with its trade, as will the Master Plumbers' Association the display in its department. During the show week the convention of the National Builders' Association is to be held, to which many who are interested in the exhibition will be drawn.

Recently the home of Mrs. Joseph Smith, Brantford, was completely wrecked by a gas explosion. There were no gas connections in the house, but gas leaked into the cellar from the sewer or gas main in the street. Mrs. Smith went down cellar with a lamp and the explosion followed, blowing out the side of the house and raising the structure off its foundations. Practically all the rooms were wrecked. The woman is at the hospital and is not expected to recover, being very badly burned. The incident is of particular concern to plumbers, as in such cases the cause is often wrongly attributed to defective plumbing. The local trade may move to protect itself in this regard.

J. E. Farrell, plumber and steamfitter, North Bay, entertained his employees at a banquet given at the Alexandra Cafe on the evening of March 12. Covers were laid for fifteen guests, all employees of the firm. A well prepared dinner was done justice to and a lengthy and interesting toast list was gone through, after which several of the men added to the enjoyment of the evening by clever vocal and instrumental selections. Those contributing to the programme in this respect were Messrs. Allan, Watts, Batcheler, King and Edminson. The evening was greatly enjoyed by all present and before breaking up Mr. Farrell thanked his men for the successful manner in which they had carried out his contract work in the past.

CANADA'S DELEGATE TO CONVENTION.

"On receiving an invitation from John K. Allen, to send their plumbing inspector to attend the third annual convention of the American Society of Inspectors of Plumbing and Sanitary Engineers, No. 3 committee of our city council decided to send the writer," writes R. H. Myers, Stratford, Ont., the only Canadian in attendance at that gathering.

"Arriving in Chicago at 10.30 Sunday morning, thirteen hours behind time, on Sunday afternoon I accidentally dropped into the auditorium of the Art Institute, and learned that a meeting was to be addressed by several doctors and Health Commissioner Evans, of Chicago, on tuberculosis, and as that subject appeared to be as near 'Sanitary Plumbing' as one could get on Sunday, I remained. The whole trend of all the addresses were 'sanitary surroundings and plenty of pure, fresh air.'

"On Monday morning the members of the society began to arrive, and we proceeded to get acquainted with one another, and right here let me say that I have never met a lot of men who—

though coming from such cities as New York, Washington, Chicago, St. Louis, Cleveland, Milwaukee, Detroit, Omaha, Pasadena, and a host of other cities—were so utterly oblivious to the 'I am holier than thou' feeling. It was a pleasure to converse with any of them, and every man possessed only one idea—to make the city in which he was inspector the most sanitary city on the continent. And after each paper was read all those who took part in the discussion did so with a view of bringing out the best method, system, fixture or process, regardless of the fact that it might be contrary to the by-laws or ordinances of his own city. As the papers read at the convention will speak for themselves, they need no comment from me. I was very well pleased and profited by attending and feel sure that Stratford will lose nothing by being represented."

OPPORTUNITIES FOR MECHANICS.

We hear a great deal nowadays about the reasons why boys do not enter the shops, and many writers tell us that there is no longer any opportunity sufficient to attract bright young men to the shop, writes W. Alton, in the American Machinist.

This statement is incorrect, at least so far as many shops are concerned. While there may be many manufacturing establishments where the operator is almost a part of his machine, there are also hundreds of others where he will get enough variety of work to satisfy him.

There was never a time when there was a greater demand for first-class mechanics than now, and any foreman will say that he cannot get enough first-class men; for where one man who is capable of thinking for himself can be found, there are ten who will fall down and cry for help the moment they are thrown upon their own resources.

An incident which came to my notice not long ago illustrates this statement. It was almost quitting time at the little automobile repair shop and we were getting ready to go home, when the telephone rang and we got word that a machine was stuck ten miles out in the country with three bolts broken or lost from the steering gear. The chauffeur in charge had been a machinist before he began to run automobiles, and one of the men with him had been an operator for over a year, but both said they had nothing with them with which they could make repairs.

We got three bolts, and, as no other messenger was available, a young patternmaker in our employment offered to ride out on his bicycle with them. It was long after dark when he got there, and then he found that the bolts he had brought could not be used. He looked in their tool box and found three that would go in, but were about 1½ inches too long. Then he took a piece of their spare chain, which was of the detachable, roller type, knocked it apart, and used the rollers as washers to take up the extra length on the bolts. In about half an hour he had repaired the machine so that it could be brought in, and used the very means that the three men who were riding on the machine had at hand and did not think of using. Boys like the above will have no occasion to complain of lack of opportunity.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, March 24.—Although trade has picked up within the last week or so, it has not yet assumed normal creasing in bulk, and inquiries show that good business is anticipated later on, but until navigation opens business transactions generally will be on the light side. There seems to be much diversity of opinion as to whether building operations in Montreal and district will equal average years. Reports from the east and Northwest appear on the face of them to be much more favorable than local ones. There is undoubtedly a splendid scope for building here. Residential houses are hard to procure, while the cry for good business premises is an increasing one. The average rent in Montreal is very high, and building should prove a most advantageous speculation. But landlords seem disinclined to venture, at present, although money is moving fairly freely, and trade prospects generally improve every day. There is still plenty of time, however, for builders to regain confidence. It is therefore probable that although the season may open quietly, there will be a big boom later on. Directly the tide turns, it should turn very strongly, indeed.

Large plumbing shops are fairly busy, as there is still much contract work being carried over from last year, but the smaller concerns are somewhat quiet. Repair work has fallen off, but the breaking up of the winter, which will not long be delayed now, should improve trade in this direction.

Iron Pipe—Iron pipe remains quiet, and not much strength is expected until the opening of navigation. Stocks are heavy, and everything is in good shape for the spring demand. The new list prices are still in force, and we continue to quote \$5.28 for 1-inch black, and \$6.93 for 1-inch galvanized.

Soil Pipe—The demand has improved, although the volume moving out has not yet reached satisfactory dimensions. A week or two should make a big difference in the shipments, and some idea will then be gleaned as to the immediate prospects of building. We quote 60 and 10 off new list.

Lead Pipe—Orders are increasing in volume. Plenty of lead pipe has been going into the buildings that have been worked on during the winter. Severe weather is now defied by contractors to a much greater extent than it used to be, and not only in the city, but in suburban districts both inside and outside work has proceeded despite winter conditions. We continue to quote lead pipe and waste at 20 per cent. off list.

Solder—Solder has improved again after a period of stagnation. Stocks in the shops are being replenished in readiness for the repairing work which will come with the breaking up of the winter. We quote half-and-half 19c, and wiping 18c for fair size orders.

Enamelware — Manufacturers have become extremely busy with the result that a slight congestion has already appeared. We pointed out before the possibility of this happening owing to the restricted buying that has been going on since the commencement of the year. The holding back has resulted in consumers all wanting their goods at the same time. Prices have been advanced on bath tubs \$2.50 all the way round.

Brass Goods—The demand is still poor

locally, although reports from other centres seem to show a more promising state of affairs. There is still too much cheap stuff being dumped on the Montreal market. Prices on special lines have not changed since the last reduction.

Radiators and Boilers—It is still too early for these lines to show marked improvement, although inquiries are increasing. Prices are unchanged since the issuing of last lists.

Metals—The markets are stronger than they were, with the exception of lead. Tin has been soaring, while copper is firming under a better domestic demand. We quote: Ingot copper, 14½c; ingot tin, \$34; lead, \$4; pig iron, \$21.50; for Middlesboro No. 1, \$21.50; Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, March 26.—Business continues to improve and as a result the supply houses are beginning to take on an appearance of spring. Plumbing and steamfitters' supplies are being shipped from the various centres in increasing quantities and some large orders are holding for the re-opening of navigation. Orders are still behind hand and if business opens up suddenly there is a likelihood of a congestion of orders which will be detrimental to all who have not taken advantage of the lull for booking stocks.

The outlook in building circles is much brighter than was anticipated, the architects seem to have considerable work and as money is again freer the building permits for the next two months are expected to assume satisfactory proportions. The amount of building promised for the season is fairly large, a large number of residences of all classes have been contracted for and if building does fall off this year it will be in costly office buildings, apartment blocks, etc. To date there are but few of these large buildings in view.

The condition of the Toronto market is satisfactory, with a steadily increasing demand for all lines. Prices remain firm and the only change of note is the new list on enamelware, dated March 9th.

Iron Pipe—There is a fair demand for common sizes coming in but the orders are not heavy as yet. Stocks are in good shape among the jobbers and at the present time it is unlikely that there will be a repetition of last season's scarcity in this article. We quote one-inch black at \$5.25 and one-inch galvanized at \$6.93 per 100 feet.

Soil Pipe and Fittings—After the winter's dullness the improved conditions of the demand for soil pipe is satisfactory. This line, which is about the first to feel the approach of the building season, is beginning to open up satisfactorily. Stocks are fairly heavy and quotations are unchanged.

Lead Pipe—Orders which are coming to hand are for small quantities only.

Prices remain firm, we quote lead pipe and waste at 20 per cent. off list. Caulking lead remains at 5½c per pound and traps and bends are steady at 55 per cent. off lists.

Solder—Solder is only moving indifferently at present and the demand will likely be slow until building operations reach an advanced state. We continue to quote wiping solder at 18c and half-and-half at 19c.

Brass Goods—There has been no further change in prices since the reduction of a month ago and though manufacturers are turning out large stocks there is but little demand at present. We continue to quote standard compression work 65 per cent; fuller work, 70 per cent.

Radiators and Boilers—Stocks are large and enquiries are becoming more general.

Enamelware—The new lists issued by the Standard Ideal Co., dated March 9 show increases in the prices of bath tubs of from one to two dollars on specials and on a few of the regular stock sizes. On the majority of baths listed prices are unchanged. Kitchen sinks remain at the same discounts but net figures show an advance of from 15c to 25c. The demand is dull at present but a busy season is anticipated.

OVERCOMING HUMIDITY IN BUILDINGS.

Successful experiments as to hygiene of dwelling houses, as well as to the preservation of monuments and public buildings have been recently officially made for the first time in Belgium. The Ghent city and university libraries were seriously threatened by humidity, and certain parts could no longer be used and had to be completely abandoned. It was, therefore, decided that a trial should be made with a new system of drawing humidity out of walls, which has recently been invented by a Belgian, after long and patient researches. The experiments began July 14 and were completed on August 14. The hygrometrical degree of the air in the room, of approximately 1,200 cubic meters (42,377.3 cubic feet), where the different experiments took place, was 83 degrees on July 13. At that time a strong moldy smell was found to exist. The greater part of the wall was covered with saltpeter, while the floor or pavement was almost continually wet. On September 13, after testing the new system thirty days, the hygrometer was found to have lowered from 83 degrees to 60 degrees. The walls had become completely dry, and the saltpeter and smell had disappeared. The pavement was perfectly dry and remained so, while prior to these experiments it had always been found to be moist. In Belgium the normal hygrometrical atmosphere of buildings in good condition varies between 60 degrees and 70 degrees.

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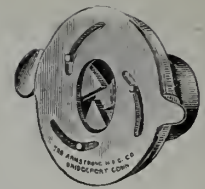
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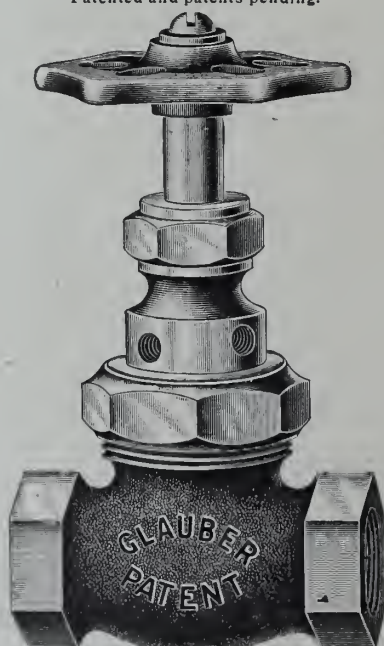
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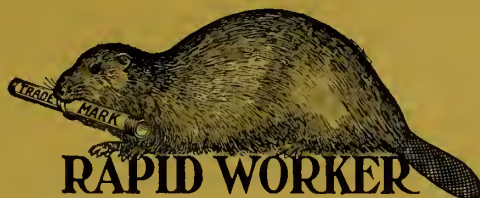
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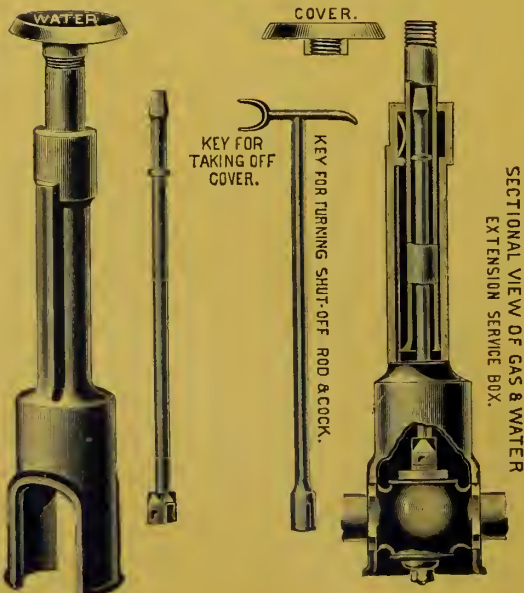
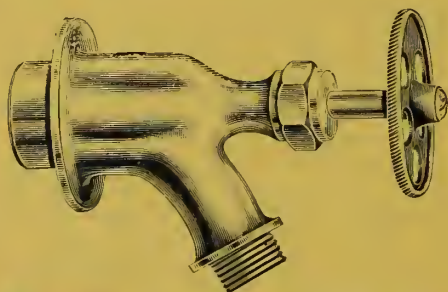
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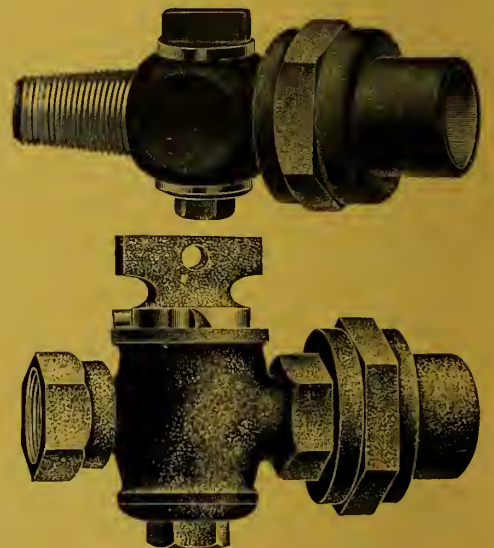
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PLATE E—294

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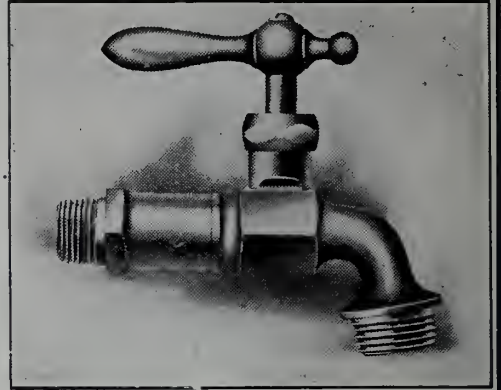
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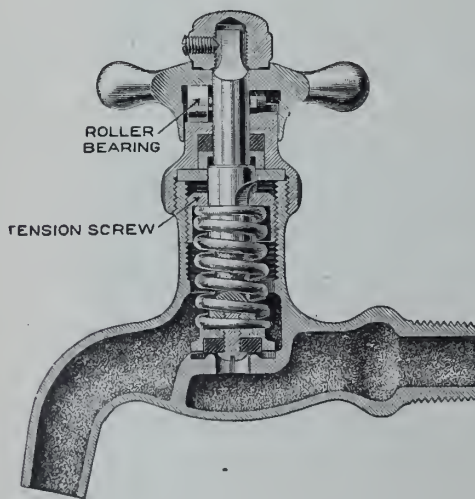
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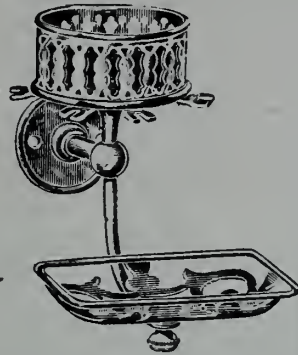
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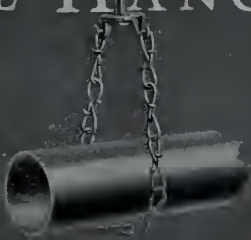
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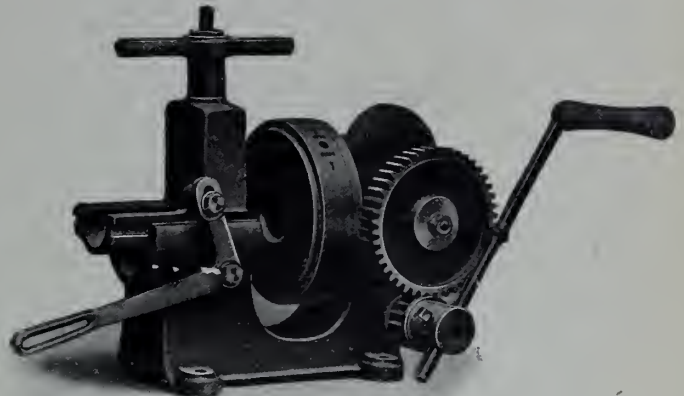
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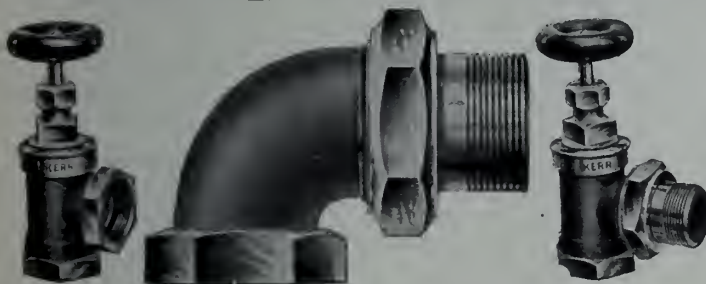
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TECHNICAL BOOK DEPARTMENT
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The Plumber in Relation to Sanitation

Paper Read by Thomas S. Ainge at the Convention of the Michigan Association of Master Plumbers, March 24, 1908.

The effect upon human life of improperly planned or defective plumbing has long been a bone of contention among those who have made a special study of this subject.

The time was when the efforts of public health officials for the restriction and prevention of the dangerous diseases were directed chiefly to the examination, testing, repair or reconstruction of the plumbing in dwellings and other places of abode, resulting in a widespread movement for better plumbing, a period of unusual prosperity for those engaged in the manufacture and installation of sanitary appliances and a sense of security to the householder who was fortunate enough to reside in a building which had withstood the scrutiny of a public health official or of a sanitary engineer, of whom there was no lack. In passing, it may be stated that, in view of the condition of the plumbing of vast multitudes of buildings of every class, an awakening of this kind about once in every five or ten years would be of incalculable benefit to the inhabitants of those localities having a public water supply and a system of sewers.

With the advent of the bacteriologist came the passing of the sewer gas bogey, as it has been termed, and, up to within a short time ago, the theory of the transmission of disease through the agency of sewers has been scouted by many writers upon domestic engineering subjects, notwithstanding which health officials in every civilized quarter of the globe have by their laws and regulations continually sought to put up the barriers for the total exclusion of sewer air from the interior of buildings.

Ejection of Bacteria From Sewer Pipes.

About one year ago Major W. H. Horrocks communicated to the Royal Society of England the results of "Experiments Made to Determine the Conditions Under Which 'Specific' Bacteria Derived From Sewage May be Present in the Air of Ventilating Pipes, Drains, Inspection Chambers and Sewers." The experiments detailed show that:

1. The bursting of bubbles at the surface of sewage under artificial and natural conditions may cause the ejection of bacteria which, if air currents are present, may be carried some distance.

2. Specific bacteria dried on the ventilating pipes of a drainage system may be separated and carried by currents of air passing through the system.

3. Specific bacteria may be ejected from fresh sewage flowing through a sewer under natural conditions, independently of the creation of bubbles and the separation of dried particles. The ejection of bacteria occurs not only when use is made of naked microbes, such as are obtained from growths on agar, but also when typhoid stools are employed as the infecting agent.

In localities provided with sewers it is customary to discharge the dejecta of typhoid fever patients and of persons suf-

fering from other dangerous diseases into the water closet, and there would be no objection to this method of disposing of such dejecta if the same were previously disinfected. That this if often neglected, or insufficient, may be gathered from a recent report on typhoid fever in the District of Columbia, relative to a careful investigation of the measures that were taken to disinfect the excreta of 492 cases of typhoid fever treated in their homes in the District of Columbia. It was stated that in only 145 cases was the disinfection efficient. It was of doubtful efficiency in 51 cases and entirely ineffectual in 286. It was estimated that 6 per cent. of the cases of typhoid fever in Washington, D.C., are due to this failure to properly care for the excreta of persons suffering from this disease. And what is true of Washington is probably true of most American cities.

Now in what manner does this question enter into and affect the work of the plumber? If, as has been proved, infection can be transmitted through the agency of sewers, and in view of the fact that in localities where typhoid fever and possibly other dangerous diseases are present, the air of sewers is always liable to infection, it is of the greatest importance that the escape of such air into or in close proximity to dwellings be rendered impossible. This will depend largely upon the manner in which the plumbing work is planned and executed, and to this extent, at least, the plumber may very properly be termed a sanitarian. But there are plumbers and plumbers, so-called. There is also a class recruited from the ranks of the other classes named, who have appropriated to themselves the high-sounding but when worthily applied the very proper title of "Sanitary Plumber." As a matter of fact, all plumbers of to-day are or should be sanitary plumbers. Those who are not should be compelled to qualify as such or to get out of the business, at least in so far as relates to the design and construction of the sanitary arrangements of buildings.

Qualifications of a Plumber.

What should be the qualifications of a plumber, apart from the neatness and dexterity with which he can wipe a joint in any and every position, bend a piece of lead pipe of any size or thickness, line a tank or sink with sheet metal, etc.? He should possess at least an elementary knowledge of arithmetic, including mensuration, mechanical drawing, chemistry, mechanics and hydrodynamics. In addition, he should possess a thorough knowledge of the conditions under which plumbing may become a source of danger to the occupants of buildings, with special reference to the soundness and stability or otherwise of the materials and workmanship, and to the security or otherwise of the system of trapping and venting. He should also be familiar with the methods of disposing of the

sewage of isolated dwellings and with the various ways in which underground bodies of water may become contaminated through improper methods of disposing of the waste and excreta from dwellings.

The list of subjects I have enumerated may appear formidable to those who have not had the advantage of a high school education, but they can be easily mastered by any person of average intelligence, and the task should prove interesting to any one with an ambition to be a master in his trade.

The young man who enters a plumbing shop with the view of learning the trade may or may not be fired with an ambition to learn the why and wherefore, otherwise known as the technique of his trade. Assuming that he is in a receptive mood and would be grateful for any crumbs of information which might fall from the lips of his employer or the journeyman whom he is detailed to assist, in how many instances would he be likely to acquire even a respectable smattering of such knowledge as will enable him to plan and execute his work according to modern scientific standards and to give a reason therefor if required to do so?

How Are Plumbers to be Educated?

In these days of keen competition the master plumber who is receiving his share of the work will be a busy man from the tap of the gong to quitting time, and will probably burn a considerable amount of midnight oil in figuring how he can land a good contract without cutting too deeply into his profits. It is certain that he will have little if any spare time to devote to the work of educating his employes in any particular phase of the work other than that of execution. Further, all master plumbers are not competent to impart to their employes such knowledge as they require. On the other hand there are master plumbers of considerable educational ability and endowed with a disposition to pause now and then for a space in order that they may impart something of their knowledge to others. A journeyman may not be competent to impart to the apprentice or helper much if anything in the line of scientific knowledge, and if competent he may not be imbued with the sentiment that it is more blessed to give than to receive.

From whence, then, are we to recruit our trained mechanics, many of whom will later fill or share the places occupied by the masters of to-day? How increase the efficiency of the workman of the present time? These are questions which demand and to some extent are receiving the consideration of associations such as yours. No other body of men is so well acquainted with the needs of the trade and none so competent to devise ways and means for the intellectual development of the present and future craftsmen.

From what has already been said it will be apparent that the acquirement

of scientific knowledge relating to plumbing must of necessity take place prior to the period of apprenticeship or, in the case of those already engaged in the business, outside of the usual hours of labor. In a few of the larger cities special classes for the teaching of plumbing have been instituted, but outside of these the ambitious plumber must work out his own salvation, often with fear and trembling, or enlist the assistance of a correspondence school.

In the larger cities, where the right to do business is conditional upon the ability of the plumber, the question of the higher education of the plumber is a vital one and must be met promptly and squarely, and it is hoped that the time is not far distant when such a condition will be imposed upon the plumbers in every locality having a public water supply and sewers. The need for the examination of plumbers and the regulation of plumbers' work will be apparent to any one who will make a tour of the streets of the average city and note the close proximity to windows which may be opened of the terminals of many soil pipes and of very many air inlets to the house sewers. And if defects are so apparent on the outside, what would an examination of the interior and hidden pipes reveal?

Favor Proper Regulations.

The enactment of laws and regulations for the control of plumbers' work, together with the proper and impartial enforcement of the same, will usually depend upon the attitude of the plumbers themselves in the matter. Thus an incompetent or dishonest plumber cannot be expected to favor any step which will show up his defective work or render him liable to a penalty or the cancellation of his license to do business. On the other hand, a good workman will have for his motto, "Better plumbing and more of it," and will welcome any legislation with this object in view.

There has been some discussion as to the proper department for the control of plumbers' work, and this work has been divided up among the various boards and departments, with a leaning in favor of the departments of health. As the protection of the public health is the basis of all plumbing legislation, the control of plumbers' work should very properly be vested in the health department of the several localities.

One of the principal obstacles in the way of the proper enforcement of the plumbing laws and regulations is the meagre compensation of those engaged in this work. A plumbing inspector should be a man of considerable education and experience, a man without fear or favor and one in whom the general public can repose confidence. Such a man, however, cannot be obtained for the paltry salaries frequently allowed for such service, and the office will often be filled with a cheap man and his duties be discharged in a perfunctory manner.

Questions Awaiting Solution.

In the work of the plumber there are many questions awaiting solution and which are believed to have a very important bearing upon the health of the pupils. For example:

Is a main trap in a house sewer necessary, and why? Are there any con-

ditions under which the omission would be considered a safe proceeding?

Are the present sizes of soil pipe too large? What, if any, danger would be apprehended from a general reduction in the sizes of such pipes?

Is the present method of protecting the water seals of fixtures against siphonage or back pressure satisfactory? Under what conditions may the venting of traps be safely dispensed with? Would it not be an advantage to enlarge the soil and waste pipes to such a point that trap vents would not be required?

What disposition can be made of the air inlets to the sewers of buildings in congested localities to protect the openings against the entrance of dirt and snow, and to eliminate the danger from the escape of sewer air from the openings during a temporary reversal of the air currents in the sewers?

The consideration of these and many other questions of equal importance might very properly be delegated to special committees of your association, and the consideration of these reports at your regular meetings would lend interest to the meetings and prove of lasting benefit to those in attendance or who might read the reports of proceedings of such meetings.

Another method by which the interest of the members of the plumbing fraternity might be awakened and their knowledge deepened in matters pertaining to sanitation is the institution during the winter months and in as many localities as possible, of regular weekly or bi-weekly lectures or talks, upon subjects of interest, to be followed by general discussions of the subjects. There are many men of ability or experience, who, I believe, would gladly contribute of their time and knowledge to such an undertaking, and I am persuaded that there would be no lack of attendance or appreciation on the part of the plumbers themselves. As these meetings would be held, primarily, in the interest of the public health, they should be under the direction of the Board of Health.

Do not wait for the other fellow to make the first move for a plumbing board and for a plumbing inspector for your locality, or, if need be, for a better and more comprehensive law for your state. Someone may suspect you of ulterior motives or make your action or attitude the subject of gossip, but you are too big and will be too busy to let a little ripple of that nature disturb your equanimity. Encourage and support the plumbing inspector if any there be in your locality, in the administration of the law, and should you by any chance run foul of him, accept his criticisms and instructions with a good grace. Finally, by your action, discourage the practice of cutting prices to or below the point where good work can be performed, and if you cannot secure your share of the contract work at a fair profit to yourself, let the other fellow have it. He won't last very long on that tack, and your work will show up well when placed in comparison with the cheaper work and prove to be your best advertisement.

An Infants' Home, to be under the control of the House of Providence, Toronto, is to be built at a cost of \$40,000.

VARIABLE CAPACITY HEATING SYSTEMS.

The principal object of the purchaser of the heating plant in the past has been to secure sufficient heating power to make his house comfortable in zero weather. Owing to the lack of appliances for regulating a plant of this capacity to the requirements of spring and fall weather, effort has been expended to divert the buyer's attention from the disagreeable overheating which is frequently complained of. There have been numerous endeavors to arrange the radiators, particularly in low pressure steam heating plants, so that the whole or a portion could be heated, as desired, corresponding with the outside temperature, says the Metal Worker. Those who have devoted their attention to exploiting such appliances, have been under the necessity of making a considerable charge for them. Being protected largely by patents the additional cost has interfered with their more general use, but the large business which has been built up in vacuum, vapor and similar systems protected by patents has been sufficient to draw attention to the advantage that can be derived from their use. Litigation over conflicting patents has caused some hesitation about using devices which might entail a lawsuit.

However, the value of a heating plant of variable capacity under control has been sufficient for the manufacturers of cast iron boilers for house heating and for heating engineers and steamfitters to devote some attention to the subject. To point out to an architect or a home builder that a plant designed for zero weather is illy adapted to spring and fall use, is no longer ill-advised, for he can be acquainted with the fact that it is possible now to install a steam heating system that will circulate the vapors arising from hot water at a lower temperature than that of steam at atmospheric pressure or slightly higher. This is one way of arriving at a successful and satisfactory regulation of the heat. It is becoming just as easy to arrange that the air shall be extracted from one, two or three sections of a radiator.

In a measure there is nothing new about this, except that special attention is now being given to the manufacture and sale of appliances for the installation of such heating systems, and it is well for the heating contractor who has not given any attention to this subject, to take it up and acquaint himself with what the market will enable him to supply his customer to make the plant which is satisfactory in zero weather just as satisfactory when the time comes that only a low heating power is needed. It should be added that the automatic temperature regulating apparatus now available, adapted to indirect heating, including furnace heating, is playing no small part in creating heating apparatus that is performing economically and satisfactorily, no matter what is the outside temperature.

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POOR WORK AND ITS CAUSE.

The appearance of a Toronto plumber in the Police Court last week, charged with installing a kitchen sink to which was attached a dummy vent, unconnected to any soil pipe, and the job being done without any permit, brings to light an evil which should be vigorously attacked in the interests of the trade as a whole.

Inquiry discloses that the case referred to is by no means an isolated one—the practice seems to be common amongst certain plumbers. Further, it has been shown that the inspection of plumbing in Toronto is by no means as thorough as it should be as a pure accident made possible the discovery of the poor job on St. George Street.

Asked for particulars regarding the poor work, the city plumbing department contended that it would do injury to the city to publish the information that bad work was done in Toronto. Consequently, they refused to supply details, adding that it was a daily occurrence for inspectors to deal with such cases.

The Plumber and Steamfitter replied that it was in the interests of the plumbing trade and the health of the citizens that good work be done, and instead of suppressing information and letting wrong doers go without a fine, the plumbing inspectors should assist in warning the public and in prosecuting every infraction of the law. The Plumber and Steamfitter also made a personal inspection of the St. George Street house, and secured full particulars without the aid of the city inspectors.

In another article the subject of plumbing inspection is dealt with. Here we desire to briefly refer to some of the causes of poor work.

When the trade in Toronto was regu-

lated by a strong Master Plumbers' Association there were few more than one hundred master plumbers doing business in the city. Prices were not cut to pieces, each firm aiming to do good work and trying to secure an average net profit of about 20 per cent. over cost of materials and labor, office expenses, etc., not included. If the plumbing regulations were broken it was the business of the inspectors to prosecute, and if the privileges of organization were abused it was the duty of the members to discipline the offenders. But organization, on the whole, we wish to point out, was a benefit to the community by enabling the plumber to get a living profit and do a good, safe job in return.

With the passing of the Master Plumbers' Association the number of registered master plumbing firms in Toronto practically doubled in a short time. Prices were cut to pieces, and, in consequence, the quality of the workmanship and materials was lessened. For example, the story is told of sixteen tenders being turned in on a job of installing the ordinary plumbing fixtures in twelve houses. Under old conditions, with the trade getting a profit and doing good work, the price would have been about \$175 per house. The job, however, it is said went to the lowest tenderer at \$115, although the wholesale cost of the materials alone at present low figures will be about \$97. Add the cost of labor and the contract price is considerably below cost.

Right here is the cause of poor work. Lax inspection may encourage breaches of the by-laws, but the chief cause is the low price received for work done. The successful tenderer referred to above may install good fixtures and do good work, and he may pay his supply house 100 cents on the dollar. But it cannot be denied that a cheap price, as a rule, means a cheap job, scamped in some particular. And now that a low price has been quoted on one job, others in the trade may have to meet the figure on other jobs, with the inevitable result of doing a good job at a loss or a scamped job at a profit. To come out even, also, those suffering from the price-cutting are encouraged to dodge the inspector with dummy vents, etc., as was done in the St. George Street house.

Price-cutting is demoralizing to every branch of the trade. Inspectors, by keeping a sharp eye on all work done, particularly at cut prices, can help to protect the public. Supply men, by curtailing the credit of firms accepting work at ruinous prices, can protect themselves and help to protect their customers doing a legitimate business. But the master plumbers in the last analysis, must rely upon themselves. Organized into an Association they can educate the members to the necessity of doing good work

and getting a fair price for it, and they can keep supply houses and plumbing inspectors posted as to those doing an unfair business.

Where the trade is unorganized, however, the best means of combatting wrong influences is through the trade paper and The Plumber and Steamfitter now reaching, as it does, over 90 per cent. of the master plumbers and steamfitters in Canada, offers its columns freely at all times to any correspondent on any subject pertaining to the plumbing and heating trades.

VALUE OF FARM LANDS.

In a recent address at Ottawa, M. Robins, Walkerville, pointed out that farm lands near towns and cities had grown enormously in value as compared with lands distant from the business centres throughout the country.

Merchants and manufacturers make the towns by their business enterprise, both in building up their own businesses and by organizing Boards of Trade to encourage outside investors to establish factories in the locality.

In this work they benefit themselves as well as enriching the owners of adjacent farm lands, some of whom are most thoughtless and ungrateful in neglecting to support their local merchants, and who buy largely from the city departmental stores, the owners of which pay no taxes or make no contributions to maintain the schools, churches and other institutions in the smaller towns.

Too often, also, the retired farmers in the small places are so unenterprising and conservative that they refuse to grant assistance to new industries after the public-spirited merchants have induced capitalists to agree to establish industries.

Much depends upon the local publisher. If he is alive to his own and his town's interests he will use all his influence to educate the farmers and retired farmers to the advantage of supporting their local merchants. The more trade given the local dealer the larger volume of stock and better selection of goods he will be able to offer his customers.

If money is sent to the city mail order houses the local merchants are weakened, they cannot spend so much for advertising, the local paper suffers, the district becomes unprogressive and the value of both town and farm lands fails to advance or falls if the movement is not checked.

The country editor has nothing in common with the mail order millionaire, and if he does his duty to himself he will be an active supporter of local enterprise and a builder up of sentiment in favor of the local merchant as opposed to the catalogue houses.

Good Plumbing Inspection Needed

The following news item appeared in the Toronto Evening Telegram of April 1st, 1908.

"Charged with putting a dummy vent in a house at — St. George Street, which is contrary to law, — was summoned to court. According to the Medical Health Department, the vent for odors from all sinks must go to the big soil pipe.

"The Health Department claim that some plumbers made dummy vents which are not connected with the pipe. They intend to go after all plumbing offering thus.

"The ease of — was remanded till called on, as he had removed the offending plumbing."

The article in question does not tell us under what conditions the offending work was done, whether it was in connection with old work or was part of an entirely new piece of work, but it is fair to assume that most likely it was in connection with an addition made to work already existing. How and why was it discovered, and why not prevented before being done?

It is against just such work that all our sanitary regulations and by-laws are directly aimed, and in direct opposition to the simplest necessities aiming at a reasonably healthy condition of the modern community.

No greater crime against the welfare of the community, from the health standpoint, could possibly be committed. Typhoid, diphtheria and malignant fevers are invited to one's very home. What could be a greater crime and who is responsible, and will the punishment fit the crime?

Is this a single and solitary instance of such work or are there more in this great and growing City of Toronto? Is this not a vital question for all plumbers who feel the great responsibility placed upon them, and is it not a subject for general inquiry upon the part of the general public?

What conditions are responsible for such work? Was it ignorance or intent on the part of the person doing the work? Was the work really done by a plumber or by a novice with no experience? Are unlicensed or uncertified plumbers permitted to do plumbing work? What kind of work has this same person done elsewhere, and what kind of work is he continuing to do?

Or was this disease disseminating work done at the full knowledge and consent of the owner in order to save a few paltry dollars in the first place with the imminent danger to the health of every occupant, or person who might be tenants in later years until the offending work was at last discovered?

It is too true that at the present day the responsible plumber receives too small a profit for the work he does, when the responsibility that morally rests with him, the various delays and interruptions to which he is subjected, and the business risks he assumes are carefully considered. Too many pieces of work which he is called upon to handle show too small a return. And it is the possibility of just such work as we have spoken of, that goes far to still further increase these conditions.

Probably too few of the general public recognize this, but the sooner they are educated to the fact that good sanitary arrangements are absolutely essential to the public welfare, the sooner they will be willing to accord to the responsible plumber a full recognition of his just and reasonable recompense for his work. The sooner the public is brought to know that the buying and placing of plumbing fixtures is quite different from buying and making up a yard of calico the better it will be for the public and the plumber.

Other questions that concern the public and the plumber are: Are the plumbing by-laws and regulations too laxly enforced and entirely too flexible? Are they out of date and incapable of correct application to present day methods?

Why should not the plumbing inspector be called upon to certify that the complete and entire plumbing arrangements of any given building are fully in accord with the by-laws and regulations of his department, and meet the requirements of modern sanitary needs?

Are the by-laws and regulations sufficiently clear so that every plumber tendering on a piece of work knows just what he will be called upon to do? Or are they so loosely framed that the conscienceless conniver can easily make lower tenders than one who is not so constituted?

Is the line sufficiently and tightly drawn to clearly distinguish between what constitute repair work and what does, or should constitute new work?

Are they so vague that the well meaning plumber is placed at a decided disadvantage, or are they enforced in such a hit and miss fashion that one does not know when they will be called upon to meet the full requirements and when

not? Blocked highways and sidewalks, and offending nuisances are soon corrected as they are directly apparent to the eye, and why should not plumbing that violates the simplest rules necessary to a healthful city be subjected to the same treatment? Would a complete sanitary inspection to see what work has been inspected and what not, and know in just what way the inspection work is being done, be a harm to the general public and the plumbing trade? Or are the plumbing by-laws too stringent if thoroughly enforced?

The quickest and easiest way to do away with any ill-fitting and obnoxious law that does not work to the greatest good of the greatest number is to strictly apply it and enforce it to the absolute letter.

Would not a rearrangement and reform of the entire plumbing by-laws benefit the public and the plumber?

Should not the enforcement of plumbing by-laws and the licensing of plumbers be put at once upon an entirely different basis? Should not there be a system of inspection where the department is made fully responsible to the public for all derelictions of duty?

Is this not the full intent of all sanitary regulation? Is this not what such a department is maintained for and for which the public pays? Are there not means by which the public can get better safeguards for the sanitary condition of the community?

There are different systems of medicine, any one of which may be good if followed in its entirety—the allopathic, the homeopathic, the eclectic and others, and there are differences in opinion among plumbers and sanitary inspectors about different systems of plumbing—about vents and their location, about back vents, about re-vents, about local vents, about the size of the main soil-pipe, about the use or non-use of main house traps, about cast iron soil pipe with calked joints, and screwed soil pipe. The points are easily, however, determined by a set of intelligent, unprejudiced men, according to the needs suited to local conditions. But the great value of any plumbing system depends very largely upon it being good, and complete, and thoroughly tight.

The sooner the plumber thoroughly lets the general public understand the absolute necessity of the very best plumbing and sanitary devices, the quicker he will derive his proper remuneration and the better will the public appreciate the benefits of such arrangements that are essential for his health and his very life.

Education and experience are good teachers, but sometimes rather slow, then a little force often acts as a good accelerator,

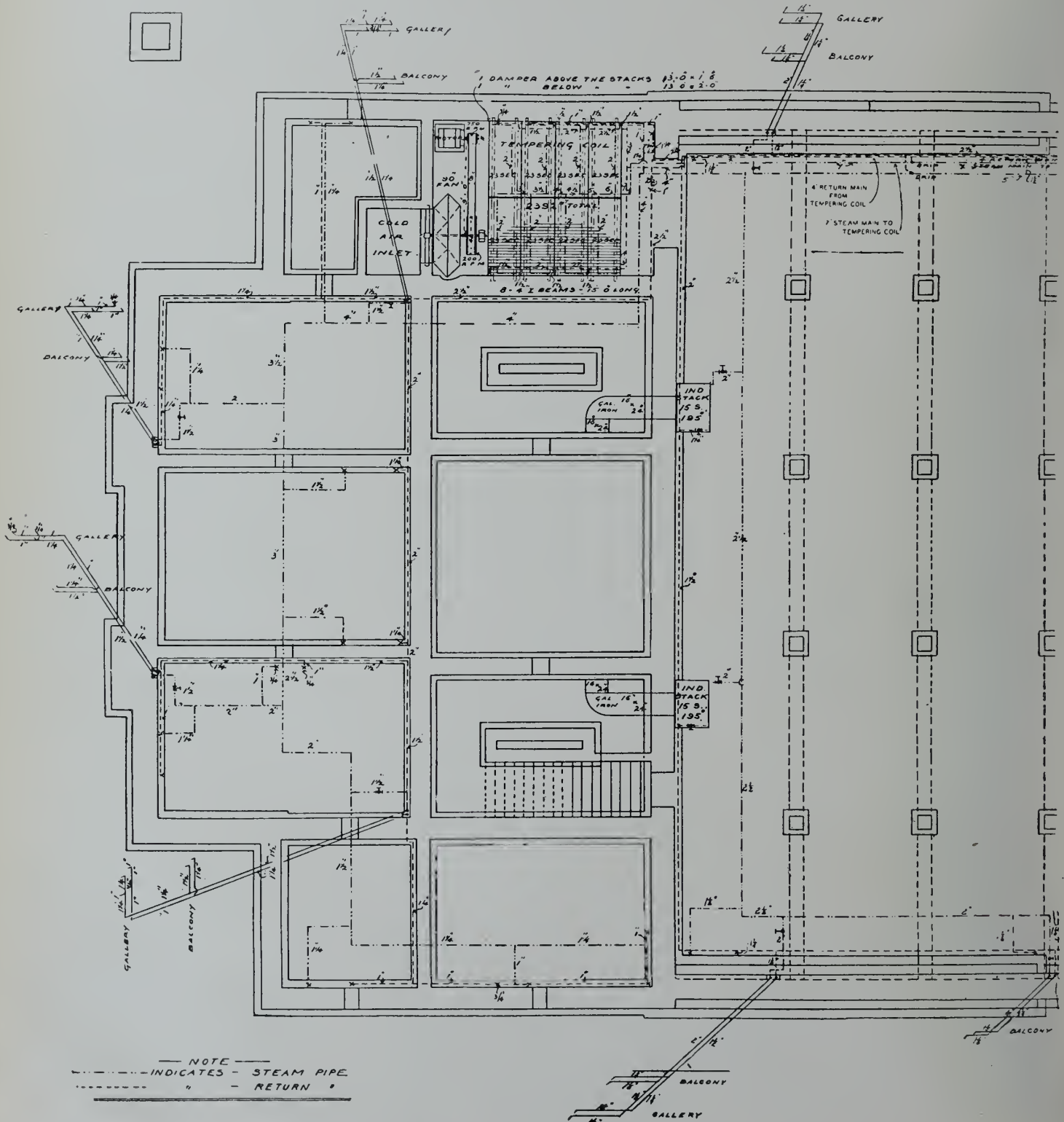
Heating and Ventilating a Theatre

Description of the Upward System of Ventilation installed in the Royal Alexandra Theatre, Toronto.

One of the arguments that are sometimes heard against the use of an upward system of ventilation is the large proportion of wasted heat that escapes with the vitiated air. This argument would seem to have special weight in a

climate as cold as that of Canada. The heating and ventilating system, therefore, which has been laid out for the Royal Alexandra Theatre, Toronto, in which the ventilation is upward, has some features of special interest.

As in the case of a number of theatres that have been equipped in American cities lately, some of which have been illustrated in these columns, the entire space beneath both orchestra and stage is given up to a plenum chamber, re-



ceiving a constant supply of fresh warmed and washed air which reaches the occupants of the theatre through scores of "mushroom" inlets located directly beneath the orchestra chairs.

The heating system is supplied with two large size cast iron sectional boilers, each having a total heating surface of 6,000 square feet. The boilers are cross-connected and arranged so that either one or both may be run at the same time to do the same work. They are connected by heavy iron breeching, made of No. 16 black iron, to an upright iron stack.

The steam and return pipes are arranged for low pressure gravity return, with the returns below the water line.

radiators throughout the administration and theatre parts of the building are two-pipe. The risers in the dressing rooms at the rear of the theatre are one-pipe, with a complete system of air mains, with automatic drip air valves for all direct and indirect radiators.

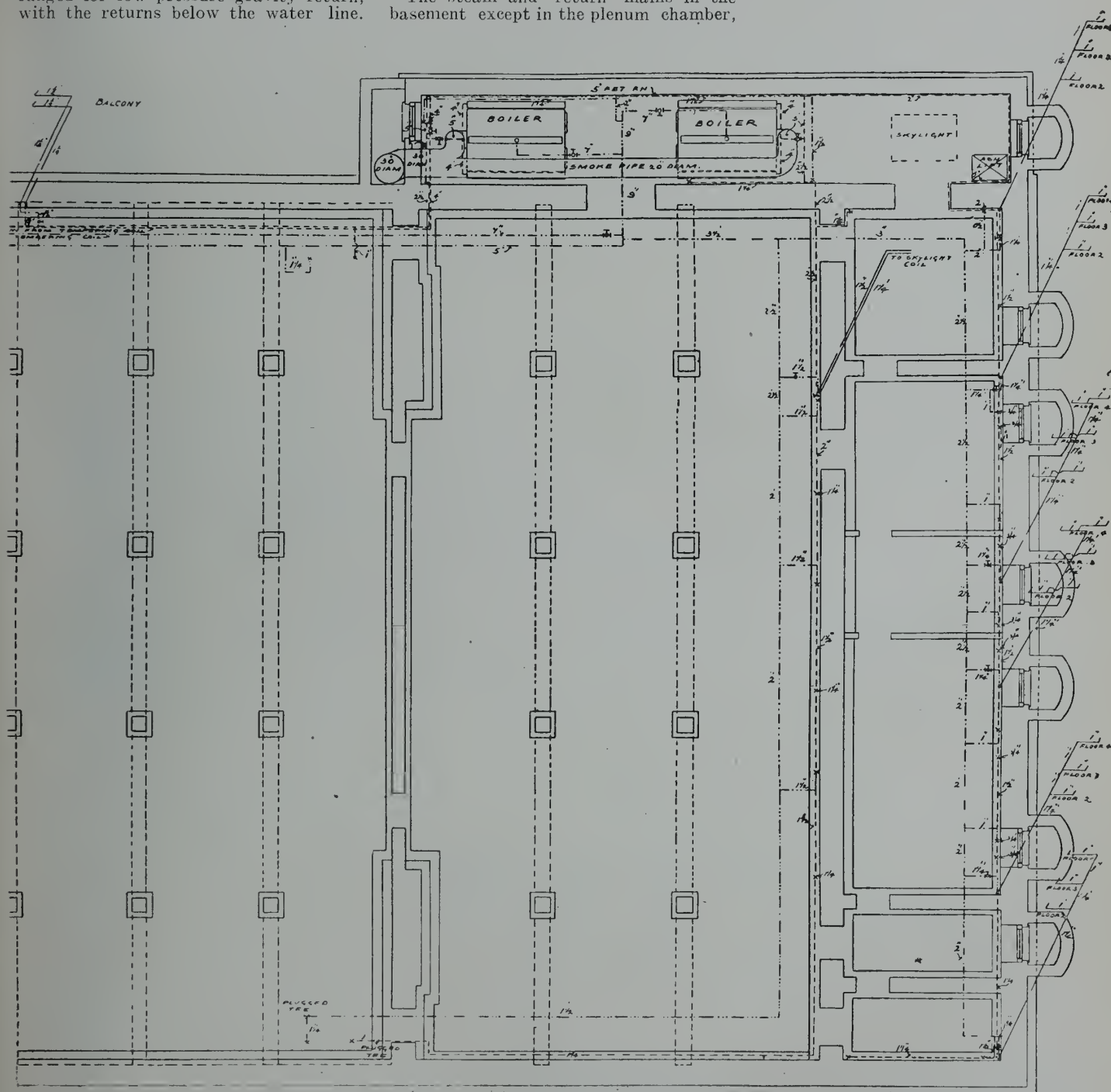
Included in the heating apparatus are a number of coils, placed in the main stage skylight and in other skylights in the administration building. Trenches with cast iron covers for the return main are located in the basement floor, as will be seen from the illustration.

The steam and return mains in the basement except in the plenum chamber,

Ventilating Apparatus.

The entire auditorium and parts of the main vestibule are heated by indirect radiation. The air is taken in through a duct on the roof of the administration wing about 12 feet above the sidewalk level and enters the settling or washing chamber, whence it passes through water sprays and eliminators.

This apparatus is located at the base of the intake shaft. A water pan 5x8 feet and 15 inches deep was constructed in the concrete floor, this pan being provided with suitable water supply, drain



Plan of Basement, Royal Alexandra Theatre, Showing Heating and Ventilating Apparatus and Plenum Chamber.

A separate system of steam and return mains connects with the indirect heating coils, with valves at the boiler.

The rising lines supplying the direct

together with the risers and radiator connections under floors are covered with 1-inch air cell non-conducting covering.

and overflow pipe. A specially constructed strainer occupying 10 per cent. of the area, through which the circulating pump draws its supply, is also

placed in the water pan. The initial water supply is delivered to the sprays in continuous circulation until the temperature becomes too high for cooling purposes, when the supply is renewed. The apparatus is also arranged so that a continuous supply of fresh water may be had to maintain a given temperature.

The spray chamber, of heavy galvanized iron, is placed immediately over the water pan and is of equal area. The air passes through the chamber horizontally at a velocity of 445 feet per minute and is carried through the spraying system which is capable of spraying 185 gallons of water per minute at a pressure of 10 pounds.

A special feature of this spray is the adjustable spoon nozzle, which allows the operator to employ either an atomized or sheet spray of varying degree, according to the requirements of the case.

In the present instance, with the water from an artesian well at a temperature of 50 degrees or less, the adjustment will allow of cooling the air to practically the water temperature.

The eliminator chamber joins the spray box at the rear and is set with six rows of plates, designed with regard to the velocity and current of the machine which removes from the air treated any moisture in suspension above the normal degree. The water arrested by the eliminators falls upon an apron and returns to the water tank.

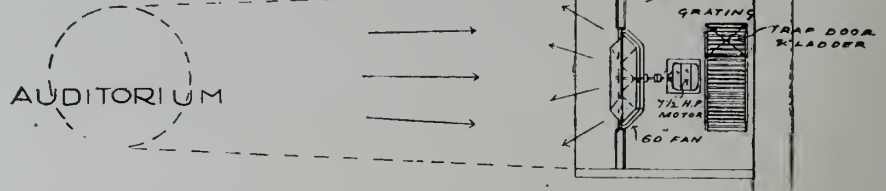
After passing through the eliminator the air is delivered to the fan. The total delivery being 30,000 feet per minute. This apparatus is the well known Aeme type, built by Thomas & Smith, and is very similar to apparat-

forward direction, centrifugal cone pressure fan driven at 200 R.P.M. by means of an 8-inch belted 12½ H.P. direct current motor, run at about 800 R.P.M. The fan at this speed delivers about 2,000,000 cubic feet of air per hour.

The heating coil is composed of approximately 2,500 square feet of indirect radiation, with by-pass above the

air and vent openings and the entire work is painted and bronzed.

The architect of the building was John M. Lyle, Toronto, Carrere & Hastings, of New York, being associate architects. The heating and ventilating engineers and contractors for the work were the Baldwin Engineering Co., New York, and we are indebted to the Heat-



Plan of one of the Vent Ducts Leading from the Dome of the Theatre.

coil. There are dampers above and below the stack which are operated by means of a thermostat placed in the plenum chamber and a main thermostat in the auditorium.

The air is admitted from the plenum chamber to the auditorium through about 400 cast iron "mushrooms," each 3 inches in diameter, clear opening, placed under the seats, as already mentioned.

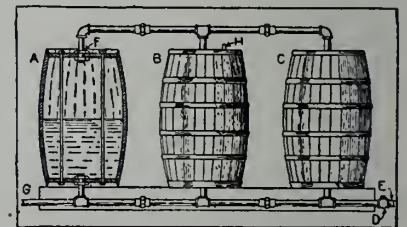
There are two openings in the plenum chamber for supplying the vestibule, each of about 3 square feet and each having supplementary indirect radiators hung at the base of the flue to increase the temperature of the air to about 125 degrees.

There is an exhaust fan placed in the roof house over the auditorium. This

ing and Ventilating Magazine for the plans, etc., secured from the New York contractors.

HOME-MADE PNEUMATIC WATER SYSTEM.

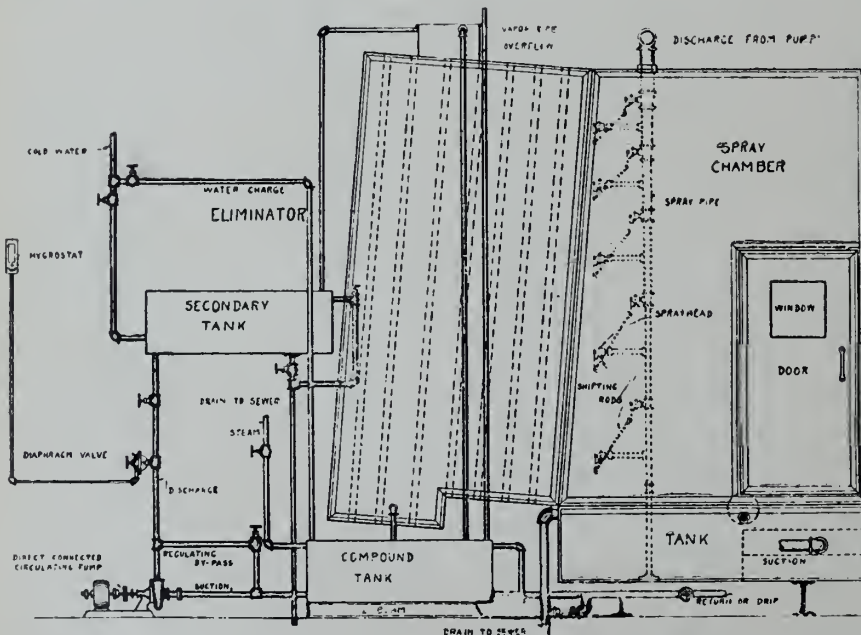
A party living some distance from a city wished to have a cheap water system for his buildings and grounds and he constructed a successful one, as



Pneumatic Water Supply.

shown in the accompanying sketch, reproduced from Popular Mechanics. Three barrels and a 20-gal. keg were secured. The keg was used for a hot water tank in the kitchen connected up in the same manner as connecting a range boiler. The three barrels were connected as shown by first removing one head of each barrel in order to put lock nuts, F, on the pipe. After replacing the heads two ½-in. rods were run through each barrel, as shown at A, and a heavy washer placed on each end with the nuts so as to hold the pressure. The pipe E leads to a force pump at the well and a check valve is placed in this pipe at D to prevent the water being forced back into the pump. The pipe G connects with the house, chicken yards and the barn. A bicycle pump is used to supply the air pressure and is connected to a bicycle tire valve which may be fastened in any one of the barrels, as shown at H. If all the connections are air tight it will require air filling only once a month. The water is pumped into the barrels by a force pump, which may be operated by hand or power.

The Fernie, B.C. branch of the United Mine Workers of America have started excavation for their new hall and co-operative stores, which will cost \$30,000.



Typical Installation of Aeme Air Washer Equipped With Automatic Humidity Control.

us installed by this firm in the Majestic Theatre, Chicago, and in the Hippodrome Building, Cleveland.

The air, after passing through the air washer, is delivered to the throat of the fan in the fan wall between the air washing chamber and the heating chamber. This fan, which takes care of the entire air supply, is a 90-inch Baldwin

fan is 60 inches in diameter and is run by a 7½ H.P. direct connected motor at 300 R.P.M. This fan chamber is connected with eight outlets in the main ceiling (which are not shown in the illustration) and a large centre opening, by means of galvanized iron ducts.

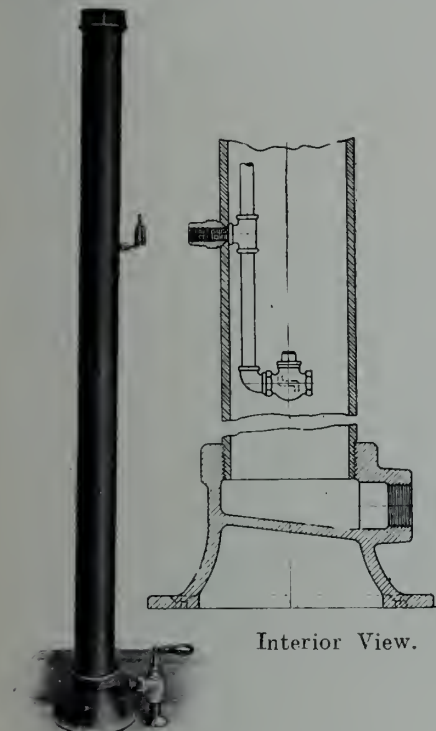
Register screens are placed at all hot

ONE PIPE BATHROOM RADIATOR FOR STEAM.

How to heat the bathroom—or rather, how to find space in the average bathroom for an adequate heater, is a problem frequently confronting the heating engineer. The solution of the problem is shown clearly in the accompanying illustrations from the last issue of the Valve World.

It is a well known fact that the majority of bathrooms have very little available space where a cast iron radiator may be placed conveniently; but this difficulty may be overcome simply and cheaply with the one pipe radiator here shown, which takes up scarcely any more room than a common size pipe riser.

The radiator is made of three and a half inch wrought iron or steel pipe of any suitable length. The pipe is screw-



Interior View.

One Pipe Bathroom Radiator.

ed into a specially constructed cast iron base, or stand; an ordinary cast iron cap covers the top.

The steam enters the base through a 1-8-inch check valve is attached which radiator valve, and passes up into the pipe. To prevent any possibility of the radiator becoming air-bound, the steam drives the air out through the small pipe inside the three and a half inch pipe (shown in the interior view) and thence to the atmosphere through an ordinary automatic air valve.

To the lower end of the small pipe a one-eighth inch check valve is attached drains this vent pipe and prevents water from escaping through the air valve. The air valve may be placed anywhere most ready of access below the top of the radiator. The Crane Company, Chicago, who have introduced the fixture, suggest the use of three and a half inch pipe as the most convenient size, equaling one square foot of radiation to one lineal foot of pipe. The base is flat on one side to permit of the radiator being placed close to the wall. The quick-

opening, self-packing steam valve is opened or closed with a half turn, and, as it has a lever handle, it may be operated either by the hand or the foot.

SAFE USE OF SLIP JOINTS IN PLUMBING.

This day of modern plumbing, with its open fixtures and the use of iron and brass pipes in supplies, wastes and vents, has brought into universal use the slip joint, as a means of connecting and its use has become a great means of rapidity in the construction of plumbing, said H. W. M'Vea, plumbing inspector, Omaha, in an address before the American Society of Plumbing and Sanitary Inspectors in February. This connection in my opinion has more opportunities for defectiveness than any other part of the system. I have thus in mind a slip joint on a lavatory supply in a residence, in which the packing blew out while the family was absent and caused a damage of \$1,000. I have also seen slip joints blow off the connections, because the plumber had been careless and cut the supply pipe a little too short and failed to secure or fasten the pipe firmly under the floor, allowing it to pull apart.

While we do not have this danger in the use of slip joints on vent connections, we have a greater one to health from escaping gases, if the connections are made carelessly. In cases where no smoke test is made on completion of the work, and even if this test is applied and joints prove tight at the time, we have the same condition of the packing deteriorating and eventually leak, which will only be discovered by sickness and odors.

Common Deficiencies in the Joints.

I wish to call your attention to the different methods of making these connections. You will have noticed that in making a connection of a brass trap to a wrought iron pipe the end of the wrought iron pipe has burrs or a rough surface so that when the joint begins to become tight the packing or other substance used becomes torn to shreds and powder and simply passes away by suction or decays by dampness or sewer gases, owing to the fact that the traps which are supposed to be 1½ in. or any other larger size will leave a space for such accumulation after being inserted into the same size wrought iron pipe. The slip joint also allows roughing-in measurements to vary, thereby allowing one part of the connection to be on an angle, and the other part straight, and not allowing the joint to properly face itself, which will in turn allow one side to tighten up and either cut or tear the gasket in two and by constant screwing up the union finally form this gasket into a ball when it would be of no use whatever.

Liability to Leak.

The slip joint connection does not leave any piece of work secure, as it does very easily become defective, even if it has been installed with the greatest care, the least jarring for instance in removing obstructions can thus render it leaky. I still have to learn of the first slip joint which does not leak after having seen service for any length of time.

In my judgment their use should be

eliminated as far as possible, both in supply and vent connections. In the case of supply connections, especially with high pressure, there is a constant danger of the blowing out of their packing, causing leaking at some time or other, as the material used in packing will deteriorate. There is nothing to recommend their use except the saving in labor, and while quite a convenience, eternal vigilance added to the first cost is the price of a slip joint.

PLUMBERS' LICENSES.

The action of the Saskatoon City Council in refusing to grant the request of the master plumbers of that city that an annual license of \$25 be charged was a mistake which ought to be corrected.

The argument that a \$25 license would deter plumbers from locating in that city is decidedly weak, as the plumbers who would hesitate to pay such a license to do business in a town where good work is demanded are not the kind of plumbers Saskatoon or any other progressive city desires.

Toronto has a low license fee and the liability of poor work and inadequate inspection which results is referred to in another article in this issue.

The best policy for a city to adopt is to require master plumbers to prove a knowledge of their business by passing an examination, to pay a reasonable license and, in large cities at least, to require the furnishing of bonds to ensure that good work be done. Cheapness should not be the end all in plumbing work. Good workmanship and the maintenance of healthful surroundings are far more important.

The following letter, published in the Saskatoon papers, signed by "A Plumber," sums up the arguments for the license in an interesting manner:

"Regarding the recent delegation of the master plumbers to the City Council requesting a license being fixed on master plumbers carrying on business in the city. I understand there are quite a few who seem to have got a wrong idea against the master plumbers' requesting a license. I should like to say a few words touching on the benefits of this license, both to the city and the citizens. I think the Council look at it from a narrow-minded point of view. First-class workmanship ought to be the first consideration in a growing city. Thorough plumbing by competent men is a safeguard to health. Work done might be passed by the inspector and yet turn out faulty. This has been the case in other cities. A plumber who is established in business in town is not likely to turn out a poor job, he has his reputation at stake. While there is no license to safeguard against bad workmanship the man on the street may undertake the work of plumbing a house which in a few months may turn out faulty. By this time 'Mr. Plumber' has taken up his kit of tools and gone elsewhere. All that the plumbers wanted was a license of \$25 or whatever the Council thought a reasonable amount. There is no mechanic who would not willingly pay even \$50 provided he could establish himself as a master plumber. It is in the interest of the city and citizens, it is for the safeguard of health that the plumbers seek a trade license."

Sanitation and Ventilation

The Great Benefits to be derived From a Knowledge of These Subjects Outlined by C. E. Oldacre.

The plumber and steamfitter who, so to speak, is a working sanitary engineer, has within his power to do more good for his community, the present and future generation than all the doctors. It is directly within his province to attract the public's attention to the necessity of sanitary devices and the methods of their practical application and use. By so doing he can do more to prevent the dangers of typhoid, diphtheria, malignant fevers, consumption, and many other diseases to which the human being is heir, than all others as his work at once demonstrates their efficacy in a practical, convincing way.

Of course, many may at once say to themselves, "What's the use," "what good is that to me," "why should I be a missionary," "where do I come in," "what do I get out of it."

The necessity of the use of modern and up-to-date sanitary arrangements thoroughly and clearly brought to the attention of the public means directly a greatly increased use of the goods and apparatus necessary to the work.

If the consumer knows there is a direct benefit to his own and his family's health, and that there is an immediate lessening of danger from ill-health and prolonged periods of sickness, he at once desires to become possessed of such for reasons far beyond any desire arising from personal comfort or a desire for luxury. Let the plumber and steamfitter take the stand therefore, that sanitary devices properly and intelligently applied are not luxuries in any sense of the word, but are prime necessities.

Business Will Result.

There is not a town or hamlet in this broad land where there is not ample opportunity for the spreading of just such knowledge. By giving such information every plumber is bound to be greatly benefitted, both directly and indirectly. Leaving aside entirely the question of the great good he is doing his community by such work, the results in a business way to him will amply reward him for all his trouble—it will bring him more trade than any one other method he can pursue. Let us cite a practical example and the result in this case applies with equal force to any other community.

Some time since a city of fair size in Ontario was without practically any system of sewerage. Many houses had no cellars, for if such had been built in many cases there would have been constant trouble from water; few houses had any modern system of plumbing, in fact sinks, lavatories, bath tubs, and a domestic water supply was unknown in the majority of the houses, and most of the houses and business blocks were without heating systems as there could be no cellars in which to place heaters. What a marked change there is as soon as a sewerage system is installed! When not very long ago there was a very limited demand for the plumber and steamfitter, now many of the houses and business blocks are being fitted with modern heating and plumbing

goods. The demand for such goods was created in no other way than through the installation of the sewerage system. It was only by going to the foundation that the demand for such goods was made possible.

Let us cite another and larger example. Some few years ago the city of New Orleans was only provided with gutters along the edge of the street or roadway. Although it was a most expensive undertaking for the city, on account of the land on which the city is built being so low-lying, relative to the waters of the Mississippi River, a complete drainage system for the entire city was installed and the sewage is disposed of through pumpage. Since this has been accomplished, thousands and thousands of dollars' worth of plumbing and heating goods have gone into this city, to say nothing of the immense benefit that has been derived from a sanitary point and the decrease in the death rate.

How Sanitation Has Helped.

It has been through the recognition of the benefits of sanitation and reasonable sanitary regulations that it has been made possible for the United States government to engage in and prosecute the construction of one of the largest engineering feats of the present day, the building of the canal across the Isthmus of Panama—something that the French spent millions of dollars on and which cost thousands of lives. The work is entirely in charge of a sanitary department and the results have been such as to convince the most skeptical of the great benefits accruing from correct sanitary appliances. When the Americans took charge of the work in May, 1904, not a single building had a modern system of plumbing. The French Canal Company's headquarters was the only building in which there was any pretext at plumbing, and in no other building was there a sewer or cesspool connection.

Through the same process, Havana has been changed to a healthy city and many other towns and cities in Cuba and Porto Rico have been benefitted by modern sanitary arrangements.

Thousands of dollars have been thus expended for plumbing goods and fixtures and the demand for the work of plumbers has been increased many fold. In fact, several enterprising American supply concerns now maintain branches in Cuba and send their representatives there regularly.

There is not a community in the Dominion where the use of improved and modern sanitary devices could not be vastly increased by the advocacy of improved sanitary methods. It is largely a matter of education, not a matter of force, and no one is in so good a position to bring about such conditions as the plumber and steamfitter and reap a great reward for the time and energy spent in that direction.

Get the Community Thinking.

Every plumber and steamfitter is in possession of sufficient facts which he can relate from his personal experience

and can gain many more from the perusal of his trade paper that can be used to set his community thinking along correct lines. Let every one do this and the use of modern sanitary devices will increase many fold by leaps and bounds.

An indirect way of doing this is to interest the editor of his local paper in which he advertises in a few of the advantages of improved water supply, correct methods of sewage disposal, either through town systems or by means of septic tanks in isolated cases, the decreased dangers to health derived from a proper water supply instead of from open wells, and correct sanitary arrangements, and the benefits derived from properly ventilated homes, churches and schools. The local editor is deeply interested in all matters of a direct benefit to the community—anything that helps the community at once helps the editor. He is as much interested in such matters as he is in the latest political deal, and the small talk of the neighborhood.

Coupled with the question of sanitation is that also of ventilation. The two subjects are directly allied and the wide dissemination of their truths are the greatest enemies of disease and bodily discomforts.

Tuberculosis, or consumption, as it is commonly called, is essentially a house disease, more than an infectious disease, and is quickly terminated by fresh air in our school buildings, auditoriums, homes and offices and cleanly habits, together with plenty of sunlight.

Ventilation and Health.

Ventilation in our homes doesn't mean altogether to hoist the windows of our sleeping rooms wide open to a chilling northwest wind when we retire, and where we spend an average of not over eight hours, but it means more, it means to each and every person occupying the house the other sixteen hours that there should be nothing short of thorough ventilation at all times and that the sanitary arrangements must be of the very best kind.

The intelligent consideration of the question of ventilation means less sickness and more comfort in the home, and thorough modern heating arrangements. The air required can be heated or warmed before admission to the various rooms at no greater expense than if the air is first heated to a greater extent than required and diluted with fresh air from the outside at a very low temperature.

The proper heating and ventilation of our schoolrooms, churches, office buildings and public institutions require just as careful consideration. No method for the heating of such buildings, where a considerable number of persons gather for any period of time is complete or sanitary unless ample means are at the same time provided for a sufficient change of air at all times that will maintain a reasonable purity of the atmosphere.

Many a minister has talked to a listless and an apparently disinterested congregation, many a school child has been inoculated with the seeds of tuberculosis in our schools and many a pallid cheek has been gained by a clerk or official in our offices through no other means, except a lack of the life giving properties of pure air.

Speaking along these lines, the Mont-

real Standard of April 4, 1908, says in an editorial:

"Montreal's mortality statistics make appalling reading. The infantile death rate is 58 per cent, as against 26 for St. Louis, 31 for Boston and 32 for Philadelphia. Yet this huge and unnecessary infant mortality does not appear to disturb the parents—much less the general public. . . . The city's failure to provide itself with clean streets, pure water, pure air, well lighted and well ventilated housing is responsible for this huge waste of life. Montreal's present attitude to the problems presented by the presence of disease is unscientific and criminal—many people seem to be still imbued with that spirit of fatalism which once led them to deliberately expose their children to contagious disease like smallpox. . . . Tropical cities have driven out yellow fever. Vienna University can hardly find enough typhoid patients to teach medical students the symptoms of the disease. Diptheria has been mastered; smallpox has been driven out of every land where fanaticism or ig-

norance hasn't stayed the rescuing hand; consumption has been explained, and with a little systematic public effort could be controlled and eventually stamped out among humans, as it has been among cattle. . . . Our legislatures and city councils turn over the responsibility for progress in sanitary matters to physicians who, being primarily students of pathology, emphasize pills rather than public welfare. In these circumstances little attention is given to the work of removing the causes or conditions that generate disease. . . . Any real progress in sanitary matters depends upon the development of social theories—upon the recognition by the people at large of the necessity of spending public funds to remedy social wrong and deficiencies. . . . It is not enough that the city assist hospitals, suppress nuisances, and combat diseases after their appearance

A Duty to Perform.

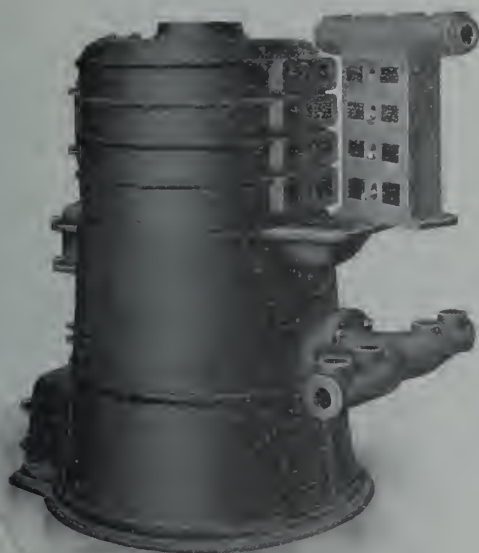
—it must condemn old rookeries, compel builders to erect hygienic housing, clean and pave its streets, set aside greater areas for parks and playgrounds, inspect factories, define dangerous trade, prescribe territorial limits to those that pollute the air, provide filtration to purify the water, abolish the smoke nuisance and take greater measures to prohibit the sale of impure foods."

When one of our great metropolitan papers is so thoroughly stirred to clearly put the conditions before the general public, does it not so surely show to every person connected with trades dealing with the question of sanitation and ventilation his duty, when no others are so well prepared to put in action the means that lead up to the remedy of just such conditions as are cited in an editorial way by the Montreal Standard.

Let us say to every reader, here is your opportunity, impress your neigh-

ing illustration. As will be seen, the new boiler, while having many new features to commend it to the trade, has not materially departed from the design which has made the "Daisy" so popular for the past quarter of a century, during which time 30,000 have been put in use. The water post connected to the four water sections, the lower of which is larger than the others in order to prevent the generation of steam, continues as one of the main features, others being the domestic water heater connections, the deep fire pot flaring downward, the ash sifting grate, the high-up feed door reaching up into the fuel door and the Daisy grates which agitates the fire and breaks the clinkers, the grates being of the interlocking knife pattern. Full ratings for the boilers are given along with other terse information. Another folder is devoted to "Viking Boilers" for steam or water, they being made in three series and twenty-one regular sizes.

Most elaborate, however, of the new



The New "1908" Daisy Boiler.



New Three Loop King Radiator.

bor, your minister, your school board, your town council, your local editor, and every person with whom you are coming in daily contact, of the absolute necessity of the proper recognition of modern ideas of sanitation and ventilation as adapted to the present day conditions. It can not harm you to do so, and is sure to redound to your own welfare, as well as that of the general public.

"1908" DAISY BOILERS.

Cluff Brothers, Toronto, selling agents for Warden King, Limited, Montreal, have issued three advance catalogues of their heating goods preparatory to the publication of an elaborate work comprising their complete line.

Interest will be centred first upon the advance sheets describing the "1908" Daisy Boiler, shown in the accompany-

publications, is the advance catalogue of King Radiators, sixteen pages of neatly illustrated and printed being included. A feature of the booklet is the giving of actual rather than nominal ratings, this being a step in advance of the method of rating hitherto in practice amongst radiator manufacturers. As the catalogue says: "The King can always be relied upon to measure up to the full rating quoted. Another feature emphasized is the uniformity in ornamentation, regardless of size, the ornaments being raised in the metal. All the connections are screwed nipple."

Hot water and steamfitters who have not yet received copies of the new catalogues should forward their names to be added to the mailing list to receive not only the preliminary publications, but also the "up-to-the-minute" catalogue to be published at an early date.

NEWS OF THE TRADE IN CANADA

The proposed normal school at Fairview, B.C., will cost \$80,000.

A new courthouse will be built at Kamloops, B.C., to cost \$56,000.

A new school building will be erected at Craik, Sask., to cost \$12,000.

Herbert Weston will build a brick business block at Saskatoon to cost \$150,000.

The judicial district of Brandon, Man., will build a new court house, costing \$100,000.

A post office and customs house will be erected at Sherbourne, N.S., at a cost of \$25,000.

Hill & Nordell, West Selkirk, Man., are adding a plumbing department to their hardware business.

A gas plant is among the contemplated buildings at Brandon during 1908. The cost will be \$100,000.

Coltman & Cloakley, Regina, will build a large apartment building in that city at a cost of \$120,000.

H. Shotton, plumber, Kamloops, has received the contract for the plumbing work on the new station at that city.

L. L. Anthes, of the Toronto Foundry Company, Toronto, has been spending a few weeks at Winnipeg on business.

Definite plans have been taken out by the school boards of Regina for building a new collegiate institute, to cost \$120,000.

The Canadian Brass Company, Galt, is rushed with orders and is working overtime. The Galt Brass Company is also very busy.

The Booth Copper Company, Toronto, has purchased property in Montreal having a frontage of 160 feet, and will move into the new premises.

James Kenny, formerly with Elliott Brothers, tinsmiths and plumbers, Kingston, has removed to Lethbridge, where he has secured a position.

The Oshawa Steam and Gas Fittings Co., Oshawa, have given \$2,500 to the family of an employe named Perkins, accidentally killed at their works.

Enoch Newman, the father-in-law of J. E. Fullerton, of Fullerton Bros., plumbers and steamfitters, Yonge St., died two weeks ago, of pneumonia.

Charles Murray, Kingston, formerly employed by Conley & Derry, plumbers, of Renfrew, has accepted a position with J. Conley, in the new Renfrew firm.

Hagen & Co., Sydney, N.S., have secured the plumbing contract in connection with the Sydney hotel kitchens, recently destroyed by fire and now being reconstructed.

Tenders have been let in Edmonton for the building of another public school during the present season. The school will be the largest in the city and will cost the city \$60,000.

Guelph water commissioners have decided to call for tenders for 21,000 lineal feet of 24-inch salt glazed vitrified pipe. Estimates for a high duty and low duty pump are also being considered.

Charles World, representing the Somerville Brass Works, Toronto, returned last week from a trip to Winnipeg in the interests of his company. He reports prospects for business in the west as very bright.

That Welland is steadily growing can be seen from the building statistics of last year, which totalled approximately

\$1,500,000. Prospects for another record season are bright and a number of residences are already under construction.

The building permits for Hamilton during March amounted to \$96,450, as compared with \$815,260 for the same month last year. The big difference is accounted for by the fact that the contracts for a number of big works were let in March last year.

W. G. D. Adams, plumber and steamfitter, 1,484 Queen Street West, Toronto, has an attractive window display, showing a bathtub, wash basin and closet and the model of a hot water boiler. Color is added to the scene with the aid of flags.

Judgment for \$40,000 has been given to the Imperial Bank in an undefended suit against F. J. Travers and George Tomlinson, officers of the Canada Radiator Company, LaSalle, Quebec. The claim was for advances on paper material and an overdraft. The company is now in liquidation.

The Master Plumbers' Association of Montreal have to seek fresh headquarters, owing to the property in St. James Street changing hands and being wanted for other purposes. It will not be without regret that the association will leave their hall, which has been the scene of so much active work and good fellowship.

City Engineer Craig, Kingston, has asked the city council to appoint a plumbing inspector. He wishes to have an expert plumber given the duties of inspection of the city, as it is impossible for him to find time to act as plumbing inspector, which duties last year had been added to the engineer's duties. Several applications have already been made for the position.

The Western Plumbing and Heating Co., Saskatoon, have purchased a lot on which they intend erecting a new building 24x50 feet, two storeys. The ground floor will be used as a showroom and workshop. The first floor will be divided into rooms and offices, and the basement will be used for storage purposes. The same firm a few days ago was awarded the contract for plumbing and heating a new court house at Battleford. They are at present employed putting in plumbing fixtures in the new court house built there.

Jas. Watt & Son, plumbers, Chatham, Ont., have put up a sign over their place of business, which, so far as colors are concerned, is a distinct novelty, striking sharply away from the straight and narrow path of black and gold, or black and white. Watt's have a yellow front, and the new sign harmonizes. The main portion contains the firm name in gold and black lettering on a dark yellow ground. A little square of orange at each end is devoted to Standard Ideal plumbing fixtures and Standard Ideal enamelware featured by the firm. The effect is novel and quite tasty.

The plumbing of the new City Hotel, Saskatoon, has been completed by G. G. Taylor. The work occupied the greater part of the winter, and some extra fixtures had to be installed which were not in the contract. In the basement a one hundred gallon boiler was fixed overhead in the furnace room. This will be heated by a jacket heater, and will supply hot water to the bath-

rooms and lavatories. Some difficulty was encountered by the plumber in fixing the closet bowls. A concrete floor was laid down, and in many cases this had to be chiseled away in order to let the bowls in flush with the floor.

PREPARING FOR FOUNDRYMEN'S CONVENTION.

During the past month very active steps have been taken by Canadian foundrymen in the interests of the convention of the American Foundrymen's Association and the Foundry Supply Association, which is to be held in Toronto during the second week in June. Papers by eminent foundrymen on topics of interest will be given at the sessions of the Foundrymen's Association, and machinery hall and the process building at the Exhibition grounds will be devoted to foundry exhibits. A feature of



L. L. ANTHERS, TORONTO.

Of the Toronto Foundry Co., Vice-President American Foundrymen's Association.

the exhibits this year will be the fact that there will be a cupola installed which will supply iron for pouring the molds prepared by the different molding machines.

SITUATIONS VACANT.

TRAVELER WANTED—For wholesale plumbing supplies, must be a worker, and know the business thoroughly. Central Ontario territory. Apply to Box 706, PLUMBER AND STEAMFITTER, Toronto, giving experience, and where now, or last employed. (7)

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in **THE BOOKSELLER AND STATIONER**, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

ADDING MACHINES.

ELLIOTT-FISHER
ADDING TYPEWRITERS

ELLIOTT-FISHER, Limited, 129 Bay St., Toronto

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, April 7.—An increasing bustle in the supply houses shows that conditions in the plumbing industry are picking up. In anticipation of the building season starting soon, plumbers are replenishing their stocks, and although the buying is not so large as in former years, still it is satisfactory, considering all circumstances. It is difficult to estimate what the building trade will be like this year. One architect is full up with plans, while another is extremely slack; one contractor has more work in prospect than he will be able to cope with, another has not a tender in view. From a general survey it looks, however, as if the number of smaller residential houses will be about the same as last year, but the large business premises, factories and expensive residences will show a big falling off.

Plumbers not engaged in contract work are still somewhat slack, as repairing work has fallen off. Houses that have been worked upon during the winter are being rushed now, ready for May 1, and this is keeping many shops busy. There is consolation in the fact that once the foundation of a house is laid it does not take long to put up the walls and place the roof on, so that the inside work can proceed. There is not a very long interval, therefore, between the opening of the building season and the rush for the plumber.

Prices of materials are practically unchanged, although with the coming lowering of freight rates there will be some revision in one or two lines later on.

Iron Pipe—Still quiet, but will open out when navigation starts. Inquiries are coming in better and the prospects are that some good orders will be placed for future delivery. We continue to quote \$5.28 for 1-in. black, and \$6.93 for 1-in. galvanized.

Soil Pipe—Soil pipe is moving more freely, but users are not inclined to purchase too freely before they can estimate what the building trade will be like. Stocks are in good shape and all that is wanted now is warm weather and busy contractors. We quote light, 3 to 6 inch, 60 off; medium and heavy, 2 to 6 inch, 70 off; 8 inch, heavy, 40 off.

Lead Pipe—Lead pipe is fairly active, and still feeling the reflex of the building that has been going on during the winter. Some good orders have been placed, and prospects for a healthy spring demand seem very fair indeed. We continue to quote lead pipe and waste at 20 per cent. off.

Solder—Solder continues to improve, especially among roofers who are getting in a good stock ready for the coming call on their services. We continue to quote half and half 19c, and wiping 18c for fair size orders.

Enamelware—An extremely busy month has just been passed by manufacturers, and if the same conditions obtain in April, there will be no kick coming. Inquiries are favorable and things are shaping well for a busy spring.

Brass Goods—The demand continues poor. Production is being restricted, and the market is therefore in better shape than it was. Prices are about

the same. Standard compression work 65 per cent.; fuller work 70 per cent.

Steam Fittings—With the other lines, steam fittings are slow just now, but should commence to move well next month. We quote 60 off.

Radiators and Boilers—It is still too early for these lines to show good strength. Orders for future delivery are increasing and inquiries seem to show a most promising outlook. We quote boilers 50 off.

Metals—Higher prices are ruling in the primary markets in tin, copper and lead. Unfortunately this is due more to speculative than to genuine consumptive buying. In these circumstances the markets cannot be considered strong. We quote: Ingot copper, 14½c; ingot tin, \$34.50; lead, \$4.10; pig iron, \$21.50; for Middlesboro No. 1, \$21.50; Summerlee, \$25.50; sheet zinc, \$7. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, April 7.—The supply houses report business to be gradually improving although buying just now is of a sorting character. Purchases of single articles are made rather than half dozen or dozen lots, this indicating that plumbers throughout Canada are still rather conservative and merely buy for the work they have in hand. Supply houses have been kept busy shipping booked orders of enamelware, placed before the recent advance, but this business is now over, and the volume of trade cannot be expected to show any large increase until the building activity commences.

Heating contractors have been quite busy for this season of the year and some of the houses report exceptionally large orders received during February and March. One supply house, for instance, announce that their February business was 80 per cent. greater than February of a year ago, and March showed up equally as well. This, too, is in spite of the higher prices for boilers and radiators, and a selling staff considerably smaller than employed a year ago. Most of this business was secured in the city, orders from the country being less plentiful.

Toronto journeymen plumbers, according to the daily papers, have decided to maintain the strike declared in May, 1907, and as the bosses claim to have plenty of men available to carry on all practical work in hand the large employers are well satisfied to have the struggle continue.

The opinion generally expressed among the trade is that 1908 will show a satisfactory total before the year is out. The decreased cost of building materials etc., will encourage many persons to do building this year, and this will largely make up for the falling off in speculative building.

Prices all along the line remain unchanged, and supply houses are holding their quotations firm. Reports of price cutting are heard, however, amongst master plumbers, one case reported being that a customer wished to give out plumbing for a dozen residences, sixteen plumbing firms tendering, and the job being given to the lowest man,

whose price was \$115 per house. As this is much below the cost of material and labor, considerable speculation is being indulged in as to how the supply house which supplies the goods will come out. Price cutting of this kind is injurious to every branch of the trade, as even though the supply house secures payment for the goods, the low contract price will force the contractors to do the cheapest possible work, this having a demoralizing effect on successful and unsuccessful tenderers.

Iron Pipe—Reductions have been made on the small sizes. We are quoting one-inch black at \$5.25, and one-inch galvanized at \$6.93 per 100 feet. Malleable fittings are 35 per cent., and cast iron fittings 60 per cent.

Soil Pipe—Business is improving, but sales are not very heavy as yet. There is plenty of goods available. We are still quoting light pipe, 60 per cent.; medium and extra heavy, 70 per cent.

Lead Pipe—A fairly healthy demand exists, but sales are in small quantities only. Prices are unchanged for lead pipe and waste at 20 per cent.

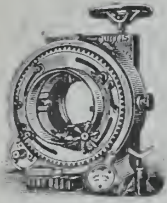
Brass Goods—Some good sales are reported but on a whole business is light. Manufacturers are producing in very small quantities, some of the factories which are not advertising, being closed entirely. Raw material is cheap, but in the face of a light demand there is a hesitancy to stock up and manufacture goods for future sale. Supply house stocks are also low. It would not be surprising to hear of considerable difficulty being experienced in securing goods should a demand be created by a rush of business throughout the country. Prices are about as low as they are expected to go and if any change occurs it will likely be in the way of an advance. We are quoting standard compression work at 65 per cent. and fuller work 70 per cent.

Radiators and Boilers—As stated above, a surprisingly large volume of trade was done in February and March, considering general business conditions. Prices, too, are being kept very firm. Orders for future delivery are increasing and the outlook appears to be brightening.

Enamelware—Orders booked before the recent advance have all been filled, and business is again light. Prices are unchanged, the new list now in force being practically the same as that governing the market last summer.

NEW ORGANIZATION IN TORONTO.

About forty of Toronto's Master Plumbers met on April 8 and took steps towards organizing a new Master Plumbers' Association, independent of those in the Plumbers' Section of the Employers' Association. Another meeting was called for Friday night, and more will be held next week. The employers in the new organization favor treating with their employees, through arbitration, rather than declaring for the open shop, and refusing to negotiate with the journeymen's union. Andy Wright, of John Wright & Son, Yonge Street, and Dan Glenn, Lippincott Street, formerly foreman with the Purdy, Mansell Company, are two of the active promoters of the new association. They claim they will have 150 members enrolled in a short time.



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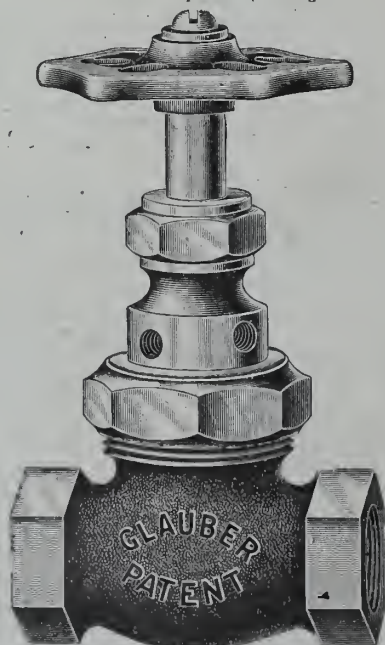
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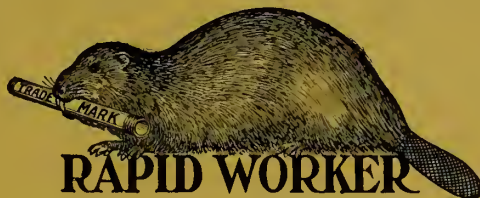
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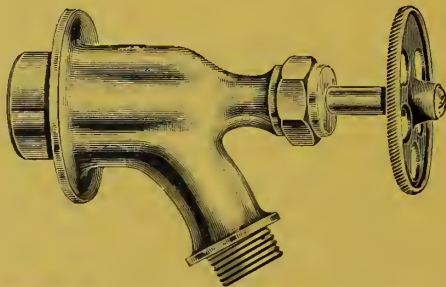
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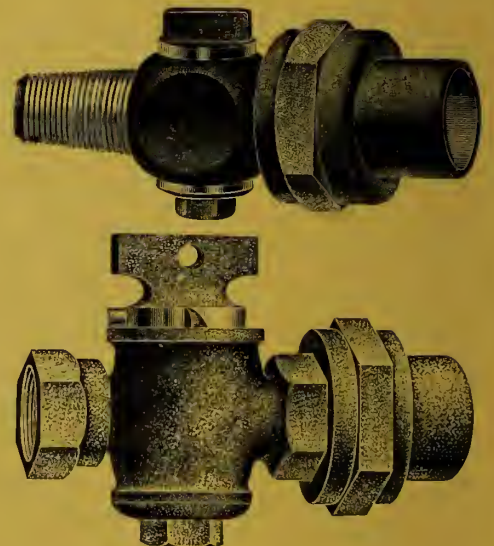
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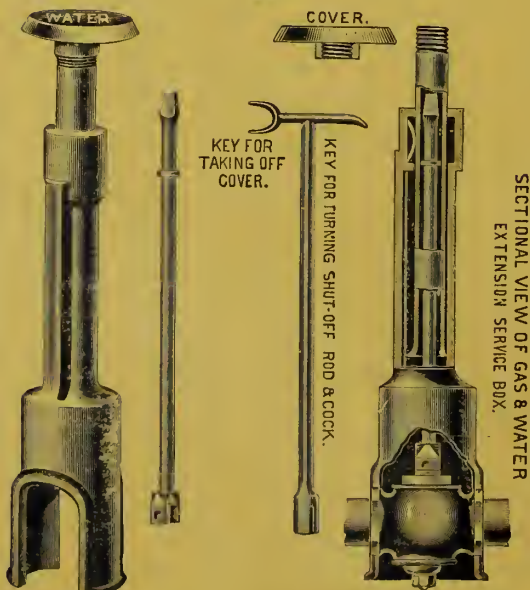
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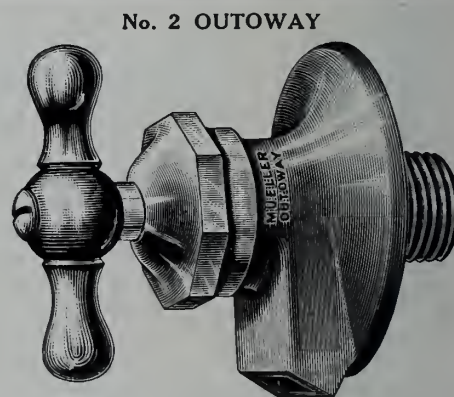
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section will save his customers coal — incidentally, on the small sizes, there's only one joint to make — see cut—

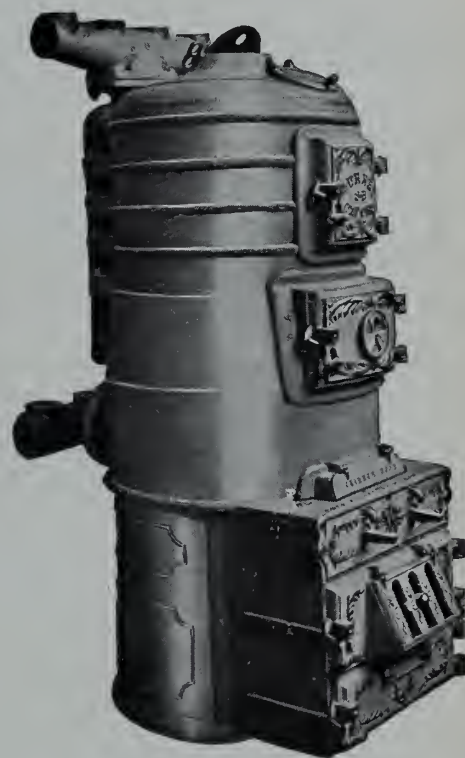
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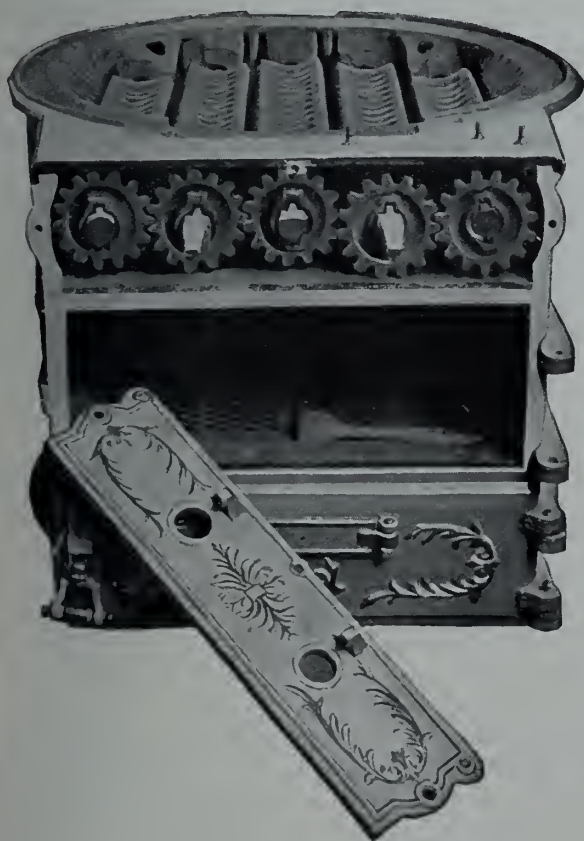
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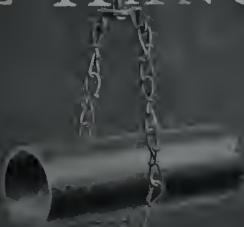
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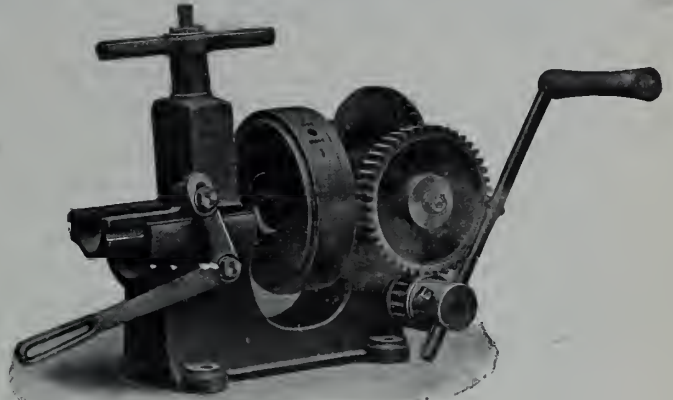
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MONTREAL, TORONTO AND WINNIPEG, APRIL 22, 1908

ONE YEAR OLD.

A year has passed since The Plumber and Steamfitter was established as a fortnightly paper to record the news and become a forum for the discussion of technical and business matters of interest to the plumbing and heating trades in Canada. When passing the milepost in the paper's history it will not be out of place, therefore, to briefly review the work accomplished and outline some possibilities for the future.

Established with the prestige of nearly a score of years connection with the trade as a department in Hardware and Metal, the new paper immediately jumped into popularity, the rapid growth of the subscription list surprising even the most enthusiastic on the publishing staff. The trade in Canada wanted a paper, and they lost no time in showing their practical appreciation of the effort to establish a purely plumbing and heating paper, dealing particularly with the climatic conditions peculiar to the country north of the Great Lakes.

With a subscription list already covering over ninety per cent. of the trade in Canada, including both the largest firms in the big cities and the smallest one-man shops in the little places, where the water is chiefly supplied by gas engines or windmills, the paper soon succeeded in winning the support of the National Master Plumbers' Association and of the manufacturers and supply houses catering for the custom of those who undertake plumbing and heating contract and jobbing work.

In addition to establishing the paper on a sound business basis, satisfactory progress has been made in developing a staff of Canadian writers and contributors.

Our United States contemporaries, after long years of work, have educated their readers to the value of discussing perplexing problems in their trade papers. In Canada the trade has not yet fully realized the advantages of open discussion, but steady progress is being made and the number of letters written by subscribers for publication is constantly increasing. Herein lies one of the main advantages of a plumbing trade paper—the opportunity to send descriptions of jobs or ask questions to be answered or discussed by others who are endeavoring to solve the same problems.

Again we would remind readers that the columns of The Plumber and Steamfitter are open at all times for letters on any subject of interest to the trade. Or if readers disagree with any points made in articles published letters are invited on the subject.

• • •

During the past year The Plumber and Steamfitter has consistently advocated trade organization. So long as

men are unorganized there will be price-cutting and bad feeling, small profits, and scamped work. Having so close a relation to the health of the community it should be the aim of every master plumber to build up a reputation for doing high-class work at a fair price.

The Plumber and Steamfitter has also conducted discussions on the possibilities of developing business in the country districts, on steam heating in practice, on the use of the main trap, on the question of septic tanks, sewage disposal, etc., while so great an interest has been taken in the articles on "Determining Radiating Surfaces," that it has been decided to publish the series in book form.

Probably the most important work done during the entire year, however, was the publication of the articles on plumbing inspection in the last issue of The Plumber and Steamfitter. There seems to be a diffidence on the part of the Toronto civic officials to take up the question, but sooner or later they will be compelled to. The policy of suppressing the truth, so far as the plumbing trade is concerned, was settled years ago, and it is now everywhere recognized that the salvation of the trade is in doing only high-class work and co-operating with the authorities in suppressing those who, by doing poor work, make insecure the health of the citizens.

• • •

The Plumbing Inspection Department in Toronto, by allowing wrongdoers to go unpunished and suppressing information regarding scamped work, is putting a premium on poor work. The Plumber and Steamfitter takes the position that if the plumbing inspection is rigid the standard of work done must be improved as the "incompetent" and the "price-cutter" will be compelled to do good work or go out of business. Abolish this unfair competition and the honest plumber who is forced to accept work at cut prices will not be compelled to scamp his work. Do this and prices will soon find a proper level.

It is up to the officials of the Board of Health to demand high-class plumbing work and see that it is secured. There is no local association controlling the trade to maintain prices at a point where good work can be done. It is easy to secure a license (\$1) and it seems easy for firms doing incompetent work to continue doing business. With a paper of their own the plumbing trade has a force they can use to enforce proper inspection, compel good work to be done, stop the injurious price-cutting, and help in reorganizing the trade on a sound basis.

A letter from Hamilton, published in this issue, shows that Toronto has no monopoly on "scamped" work. Imagine a modern bathroom outfit installed for \$95 and

consider present costs of labor and material! Plumbers in other places are invited to beat this record if they can.

Let us, at any rate, have the views of the progressive-minded men in the trade throughout Canada on the question of plumbing inspection, poor work, low prices, low license fees and trade organization.

* * *

Herbert F. Shade, plumbing inspector, Victoria, B.C., has promised an illustrated description of the plumbing and heating systems of the new C.P.R. Empress Hotel, in that city, as well as a series of articles and sketches on the Western view of sanitary plumbing on the following subjects: "House Drainage," "Cellar Drainage," "Interception Traps," "Trap Venting," "Continuous Venting," "Domestic Septic Tanks," "Durham System vs. Cast Iron," "Use of Anti-Syphon Traps," etc.

Angus Smith, City Engineer, Regina, will contribute an article on the different methods of disposing of sewage. B. H. Myers, sanitary inspector, Stratford; George Clapperton, of Bennett & Wright, Toronto; Wm. Mansell, of the Purdy-Mansell Co., Toronto; J. W. Hughes, Montreal, and others, will contribute special articles, while arrangements are also being made for contributions from practical men in Halifax, St. John, Ottawa, Peterboro, Winnipeg, Vancouver and other places.

Another improvement is an immediate increase in the size of the paper, giving 50 per cent. more value to subscribers and a monthly total of forty-eight instead of thirty-two pages. The enlarged paper will make possible the publication of much additional reading matter—both news and technical, and we can promise both a larger and better paper for 1908.

But let it be repeated again—the value of the paper to the trade in Canada will be in proportion to the assistance each individual renders in making the semi-monthly issues interesting. Help the paper by sending the editor short letters for publication, and by letting advertisers know that you appreciate the support they are giving your paper.

PLUMBING AS A SCIENCE.

That the plumber is an essential member of the community everyone admits, but it is doubtful whether the scientific character of the industry receives equal recognition. In many quarters the plumber is still only the man who mends pipes and fixes taps with a woeful waste of solder on the floor, and the expenditure of much unnecessary time. He is a kind of necessary evil which must be endured.

But to the thinking few the plumber has a much higher standing, and rightly so. With the great improvements in sanitary appliances, and the development of hygienic principles, the plumber is now no mere mechanical operator. He has to use his brains, he has to go through a training that is far from being simple—that is, if he desires to understand and assemble the complicated sanitary systems at present in operation—and he has to be better equipped in every way than his predecessor.

It is not too much to say that plumbing is becoming quite as much a science as engineering. It is certainly just as vital. The piling up of our population, the crowding of habitations together in one solid mass, makes it imperative, if health is to be maintained, that the greatest attention should be paid to sanitation. If the evils that exist in the older cities of the world are to be avoided, if pestilence is always to be kept at arm's length, then unceasing care must be paid to hygiene, and the best of work performed by our plumbers. That the industry is putting forth its best efforts in this direction, we have proofs on

every side. It is only necessary to contrast the sanitary systems of to-day with those of yesterday, to compare the quality of the work in both cases, to understand how the art of plumbing has progressed and how the plumber has become a much greater man, both theoretically and practically, than his predecessor.

And with this development, there is no standing still. He must be constantly going ahead. New systems require new methods of application, one material gives way to another, this connection displaces that, and so on. The plumber must not only be a hard working member of society, but a thinking one as well, and what is better still, a creative one at the same time. It is, therefore, only right that he should be recognized by all at his proper scientific value. He is a sanitary engineer upon whom vital work depends. When a householder remembers that the immunity of himself and his family from disease depends upon the knowledge and work of the plumber, then he can understand what an important art plumbing is, and how far removed from mere mechanical work, are the operations of a plumber.

SOME BUSINESS SUGGESTIONS.

It is fair to say that the business of every plumber and steamfitter can be greatly increased by a little careful thinking and planning. The following thoughts or suggestions are a few that may bring to mind some methods and ideas that will lead to increased business:

Do you know any property-owners who will put in new bathroom fixtures this year?

Do you know some who are dissatisfied with their heating arrangements?

Don't you know some one who has been heating with stoves or hot air furnace that wants a better method of heating?

If the sewer system is being extended to additional streets are there not several prospective customers for plumbing work who would like to be told about the most up-to-date fixtures?

Are any of your customers or would-be customers going to enlarge their houses this year so that they will require additional plumbing and heating work?

Do you know of anyone so located that no connection can be had to a sewer that would put in a septic tank and a complete job of plumbing if the subject was brought to his or her notice?

Is there not one or more enterprising merchants in your town or city whose stores have been heated indifferently by stoves and hot air furnaces, and where they would like to do away with the dust, dirt and poor results, and be likely customers for an up-to-date hot water or steam heating job?

Are the schools in your town or city properly heated or ventilated?

Are not some of the churches in your vicinity to be heated this year with steam or hot water?

Are your lodge halls and opera house heated properly?

Do you recognize that it is hard to sell what you do not exhibit?

Is your showroom kept in the most orderly arrangement your space will permit?

Did you ever notice that generally the best lighted stores draw the most customers?

Have you ever tried running live, up-to-date advertising in your local papers?

Do you keep up with the best ideas of the trade through your trade paper?

Try answering these questions to your own satisfaction and see what further ideas they will suggest that you can put in action at once.

Hydraulics of the Plumbing Trade

J. W. Hughes, Montreal, describes Early History of the Plumbers' Art—Pumps and Their Development—Curious Facts Regarding Water—Extracts From An Address Recently Delivered Before the Plumbing Class of the Council of Arts and Manufactures, Montreal.

We are called plumbers, and the definition in the dictionary is that a plumber is one who works upon lead. This is correct enough as far as it goes. Plumbers are those who are employed in introducing into our cities and



FIG. 1
THE GOURD

dwelling that necessary commodity, water, and as for many years leaden pipes were almost exclusively used for this purpose, the term "workers in lead" was really correct in the early days. Leaden pipes, cisterns, baths, sinks, pumps, roofs, and also lead sheathings for ships, etc., were then almost universal. Lead was probably worked before any other metal. It was common at the time of the exodus mentioned in the 27th chapter of Ezekiel; the terraces of Nebuchadnezzar's hanging gardens were lined with lead, soldered together to retain the moisture,



FIG. 2
JUG OR PITCHER

while lead coffins, statues, plates, etc., are very ancient.

In the present day, however, there is far more iron used in our business than

lead. Iron pipes, pumps, baths and cisterns are now common. Besides, glass, brass, paper, etc., are also being used to a limited extent for the conveyance and distribution of water. But no matter what the materials may be, the plumber is the man who is employed to attend to the work required in their manipulation. As the plumber's special work is the handling of water—if I may so call it—a few remarks on the ancient and modern practice in this line will not be out of place.

The Evolution of the Pump.

The wild and uncivilized man, we have every reason to suppose, only used water for drinking, and his first method of obtaining it was to lie on the ground at the side of some convenient spring or stream and draw it up with his mouth. But sometimes the water may not have been accessible by this means. To get over the difficulty he would, no doubt,



FIG. 3
A VASE DERIVED FROM
A GOURD

employ the method of lifting water in the hollow of his hand. These are the first two methods of raising water by means of natural agencies, and in it is employed the principle of the pump, as by the action of the mouth and lungs the primitive man formed a vacuum and sucked up the water into his mouth; then, by the contraction of the muscles, he forced the water from the mouth into the stomach, thus employing the principles in use to-day in the lift and force pump. The second means of raising water—in the hand—was the first mechanical method of lifting water as the hand formed the vessel for holding the water, and the bones and muscles of the arm were a very finely-arranged system of levers, cords and

joints for raising the water to the desired height.

But there would also be times when he could not reach the water even by the aid of his hand, and as necessity is the mother of invention, he had to devise some means of overcoming the difficulty, and as nature had provided something that by very simple means could be made into a convenient vessel for the purpose, man was not slow in finding it out and adapting it to the purpose. This was the "gourd," a vegetable belonging to the squash or pumpkin family (Fig. 1). By cutting off the



FIG. 4
A DIPPER MADE FROM A GOURD

neck and cleaning out the seeds a vessel capable of containing and holding water was obtained and to show how correct were the first principles, as shown to us by nature, from the gourd we have our modern jug (Fig. 2), ewer, bottle, pitcher and vase (Fig. 3), etc. A bottle is exactly the shape of the gourd, as is also a decanter. A gourd with a handle on one side is a jug; with two handles, a vase. The lower half of the gourd (Fig. 4) is a dipper, while the shape of the original pot (Fig. 5) is also derived from it. With a handle it is a pipkin (Fig. 7) or saucepan.

When the difficulty arose of not being able to dip up water by means of the arm and a gourd in the hand, more inventive talent was called for. A rope or string, probably a piece of a vine,



FIG. 5
A PRIMITIVE POT WHOSE SHAPE
IS DERIVED FROM A GOURD

was attached to the gourd, which could be then lowered to a greater depth and water be drawn up. From this came the rope and bucket, and the bucket and

hooked stick, and in regular course the chain of pots—grain elevator of to-day—and by the attachment of a lever and fulcrum, with a rope and pot, the swape was arrived at. The swape is a very ancient machine for raising water and is still extensively used in all countries. It can be seen all over Canada to-day. It is a long lever fastened to a notched, upright post (Fig. 6) sometimes a fork tree being used, with a stick or rope, and bucket on one end and a big stone or other weight on the other. Then there was the Egyptian "Mental," which was a vessel with four strings attached, two on each side. A man stood on each side of a pool of water, and held a string in each hand, and by lowering the vessel and raising it by alternately slacking and tightening the ropes, water was raised and emptied on to the adjoining land. In fact, mechanical machines were first in-

of the pressure of the atmosphere, mechanical means being used to exhaust the air and allow the atmospheric pressure to exert itself upon the water to be raised. We cannot tell exactly how long it is since the invention of the suction pump, but it is claimed to have been invented by Ctesebes, of Alexandria, about 120 B.C. It is recorded that in the year 1641 a pump maker of Florence made an atmospheric or suction pump, by means of which he attempted to raise water some 50 or 60 feet. Of course he failed, as the pump would only cause the water to rise in the pipe some 30 to 32 feet. After repeated trials, the eminent philosopher, Galileo, was consulted as to the reason. As far as is known up to that time it was not understood that it was the pressure of the atmosphere that caused the water to ascend in the pipe attached to a pump, and that the pressure of

consequently a pump will, to use the common expression, not lift water as high in a country situated many feet above the level of the ocean as it will

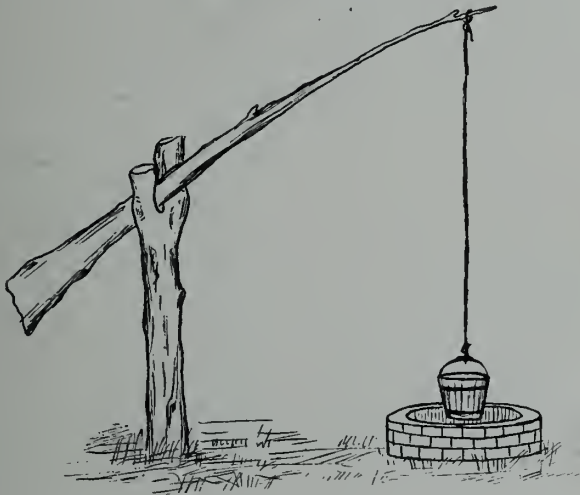


FIG. 6.
THE WELL SWAPE

vented and used for the purpose of raising and handling of water—the modern steam engine being nothing more nor less than a modification of a pump, and pulleys, levers, screws, winches, etc., were all first brought into use for the purpose of raising water. Our art as plumbers, or the handlers of water, therefore, is the most ancient of which we have any record.



FIG. 7
A PIKIN

Atmospheric Pressure on Water.

Machines adapted for raising water depend for their successful working on a combination of natural and mechanical forces. The modern atmospheric pump does its work through the agency

the atmosphere was equalled or balanced by a column of water 30 to 32 feet high. The theory up to that time was that nature abhorred a vacuum, and a vacuum being formed, the water rushed in to fill it. The only solution Galileo could give of the difficulty was that nature's abhorrence of a vacuum was limited, and did not go beyond 32 feet. Torricelli, however, in 1643, announced the great discovery that water was raised in pumps by the pressure of the air. Now if plumbers knew this they would be saved a great many mistakes.

I have heard old hands state that pumps could lift water 100 feet, and as the force by which water is raised is only capable of sustaining a column of water 32 feet under the most favorable circumstances, it can be understood how absurd such talk is. At this height of raising water by atmospheric pressure 32 feet is only attainable under the most favorable circumstances. On high lands the pressure is not so great, and

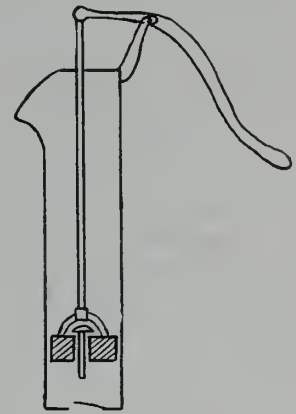


FIG 8
COMMON LIFT PUMP

at the seaside. The necessity of having the suction-pipe perfectly tight can also be understood, as ever so small a hole will allow the air to get in and cause the water to fall back into the well or tank, or whatever it may be, and so cause the pump to lose its charge. The bottom valve must also be perfectly tight. It is the same principle of the pressure of the air that causes syphons to work, and that empties the traps under our fixtures by syphonage.

It will be asked how a pump, if the foregoing is the case, can draw the water from a tightly closed and cemented brick tank or well. In reply I would say that stone, cement, bricks,

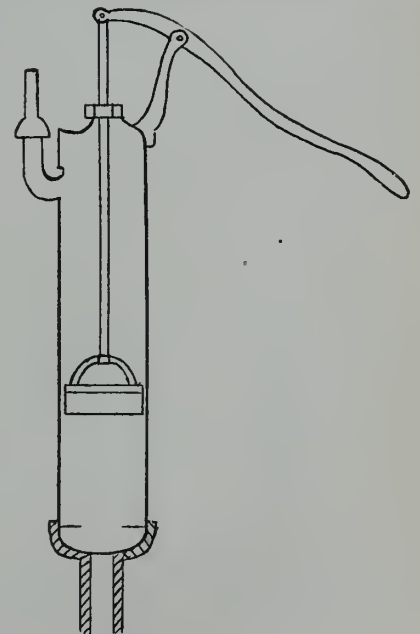


FIG. 9
LIFT PUMP WITH
CLOSE FITTING COVER

etc., are by no means air-tight. If a well could be made perfectly air-tight a pump would not raise the water from it any more than the water could be

raised from a glass tube with the lower end closed. Although it is stated that a pump will cause water to raise 30 to 32 feet, it is not safe in practice to go beyond 20 to 25 feet. It is because of this now well known law that we put the pump—or, as the plumbers call it,

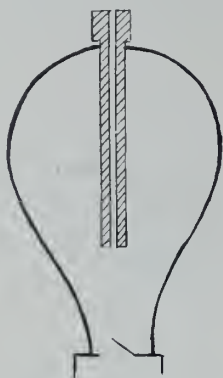


FIG. 10

AIR CHAMBER ON FORCE PUMP

the working cylinder—down near the water in a deep well, and depend upon the forcing or purely mechanical action to raise the water for the remainder of the height over 25 feet. If there is any doubt as to how far it is safe to put the working cylinder of a pump from the water, and the barometric pressure or weight of the air in the locality is known, it is a safe rule to fit it so that the sucker at its highest point in the stroke, shall not be more feet above the water than the tube of a barometer in the district contains inches of mercury, and as water in wells is liable to changes of height, an allowance must be made for a subsidence of the water. The rule for plumbers to observe is to have the cylinder fitted at a proper height from the water, and all the pipes perfectly tight.

Various Forms of Pumps.

I will now attempt to describe the common lift and the lift and force

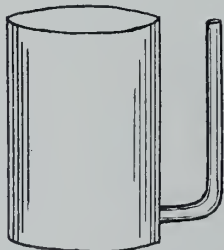


FIG. 11

ILLUSTRATING THE HYDROSTATIC PARADOX

pump. The common lift pump, Fig. 8, consists first of the barrel; second, the sucker or piston, containing a valve that opens as the piston is forced down and closes as it is drawn up. Thus, in first starting, the sucker brings a quantity of air with it, and after the water

has reached the barrel, brings the water with it. In the bottom of the barrel, there is also a valve that shuts as the piston or sucker is forced down, and opens as the sucker is drawn up, so that while the sucker is going down the air or water in the barrel cannot be forced back into the suction-pipe. The handle is merely an attachment that may be arranged as is most convenient for working the piston or sucker. This kind of a pump does not require to have a closed-in top, but if the water is to be forced up after it has entered the barrel and passed through the sucker-valve, the top of the pump must have a close-fitting cover, Fig. 9, and the sucker-rod work through a stuffing-box. Then another valve in what is called the rising-main is necessary to hold up the water while the piston is going down into the pump. An air chamber is frequently fitted on the rising-main of a lift and force pump, so that a quantity of air, which is elastic, may act upon the water between the strokes and cause a more steady

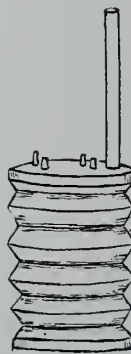


FIG. 12

THE HYDROSTATIC BELLOWS

flow of water. There are also pumps made with solid pistons, or as they are called, plunger pumps. They only require two valves, viz., the bottom or suction valve and the valve in the rising-main. They are generally used where great pressure is required, such as in hydraulic presses, etc. There are also rotary pumps—in fact, there is no end of them—made in special ways and of special materials.

Curious Properties of Water.

An important fact in regard to water is that it is height that gives pressure, not size or quantities. The area of the base has also to be taken into consideration, so that the pressure in a vessel may be greater or less than the weight of water it contains. This law of pressure leads to what is called the hydrostatic paradox—that is, that a quantity of fluid, such as water, oil, mercury, however small, may be made to counterpoise or balance the largest quantity. In other words, a quantity of water in a small pipe will balance a

quantity of water in a large pipe or cistern, Fig. 11. If it were not so, when plumbers put a large hot or cold water tank side by side and connect them with a pipe, the larger would overflow the smaller. As it is, a quarter-pipe will balance the water in a large cistern—that is, the water will stand at the same height in both if joined together. The hydrostatic bellows, Fig. 12, is an apparatus consisting of two disks connected by a band of leather or other flexible material around their edges, thus forming a water-tight case, with a long upright tube inserted in the upper disk, into which water may be poured. The small column of water in the tube lifts weights upon the upper disk, thus illustrating the hydrostatic paradox to which I have already referred. It is the application of this principle that constitutes the hydraulic press.

A cubic foot of water is 62½ pounds—that is, a cistern a foot square will hold 62½ pounds and contains 6¼ imperial gallons of water. A cylindrical foot contains 49 pounds and holds 5 imperial gallons. A gallon, American measure, contains 231 cubic inches. Plumbers should know such common facts as these so that they may be able to answer questions bearing upon their work that are liable to be asked by customers at any moment. Water has also some curious properties. From 32 degrees F, or the freezing point, up to 212 degrees, or the boiling point, it increases one twenty-third in bulk—that is, 100 gallons of water at the temperature of 32 degrees, on being heated to 212 degrees, will be so expanded as to fill a vessel holding about 104 gallons. On being cooled, it will contract or go back to the original bulk, until it reaches 32 degrees, or nearly so; but the moment it freezes, it again expands. It is, I believe, the only known substance possessed of this curious and paradoxical property. It is its expansion on forming ice that bursts the water pipes. In passing from the liquid into the solid form it increases from 8 to 9—that is, it is one part larger as ice than as liquid. So do not be afraid of bursting a pipe by putting on a hot cloth, but look after the burst and mend them before you thaw the ice. Another curious property of water is that the cold water lies at the bottom of a tank or river, and is heavier than the warm, up to a certain point, or rather down to a certain point, but as soon as it freezes and becomes ice it becomes, although colder, lighter, and floats on the top. It will be understood therefore that water is a substance having properties peculiar to itself, and in order that we may do good work, we must understand the laws that govern the substance with which we have to deal. I would advise all plumbers to

read the following books: "House Drainage and Water Service," by J. C. Bayles; "Lectures on the Science and Art of Sanitary Plumbing," and "The Plumber and Sanitary Houses," by S. S. Hellyer. Also "Hood on Warming and Ventilating Buildings," and every book bearing upon our business. Every plumber should also subscribe to some of the papers specially printed for the trade. They do not cost much, and are just as necessary to any man wishing to be up in his business as a kit of tools.

SIMPLE VENTILATION.

Where steam heat is installed, according to Suburban Life, ventilation is especially needed, for the absence of flues and open fireplaces deprives the rooms of a constant source of pure air, and architects are often negligent in supplying efficient substitutes for them. When building a house, it is very easy to have at least one open grating communicating with the outside air placed at the highest possible point in every room, with a flap, if desired, to prevent this outlet becoming an inlet; but even when the house is built without these necessary ventilators, they can be easily made with very little expense or trouble. Perhaps the simplest method of providing a constant inlet for a room is to have a counterpart of the lower rail of the sash frame made, with upper and lower surfaces parallel. When this is put in its place and the window shut down on it, air comes in readily at the junction of the upper and lower frames and at a height which prevents those sitting in the room from feeling any draught.

CONVENIENCY AND EFFICIENCY.

Convenience in using as much as efficiency of service appeals to the average person but when these qualities are combined there is little left to be desired. The H. Mueller Mfg. Co.'s No. 2 Outoway wash tray bibb fulfils both these requirements in a most satisfactory degree. It is small and compact and fits close to the back of the tray, protruding but slightly. It is entirely out of the way of the free use of all of the space over the tray, yet it is convenient to the hand. The efficiency is also there. The bibb has the strong points of Mueller compression work and is just as effective in delivering a full stream of water to the centre of the tray as if projecting as far out as the ordinary bibb. This result is accomplished by the bent spout of the Outoway, by which means the full stream is deflected to the centre.

Plumbing for a Tourist Hotel

Address by Chas G. Brandon, Plumbing Inspector, Yellowstone Park, Wyoming, at the Chicago Convention of the American Society of Plumbing and Sanitary Engineers.

The installation of plumbing in tourist hotels, to be used only a part of the year, should not in my opinion, vary from the established plumbing regulations of any of our large cities. While the fixtures may vary somewhat, the principal point to be kept in view should be strength and simplicity, and still comply with sanitary standards. The average tourist hotel is outside the jurisdiction of any city plumbing law, and while they may come under the state law, they pay little regard to it. Therefore until the City, State or Federal law can reach this class, we should use our best endeavors to demonstrate to owners and managers of above mentioned hotels, that it is to their best interests, and the welfare of the traveling public, for the hotel proprietor to install the very best plumbing.

While the fixtures need not necessarily be elaborate or have any fancy trimmings, they should be installed with the view of withstanding a great deal of abuse, and in addition to this, traps, etc., should be placed accessible, with a view to proper drainage for the winter season. We will take for instance the water closet. I have in mind one as specified by the Quartermaster's Department, U.S.A., known as type B.5, which specifies the bowl alone to weigh 82 lbs., the waterway throughout to be 3½ in. diameter and to carry under test a solid ball 3 in. in diameter, jet arm to be concealed, water surface in bowl to be 11 in. x 13 in., depth of water seal 3¼ in., this is continued with further specifications regarding slotted holes in base, etc. It is apparent that a water closet of this description should last almost indefinitely, and having the advantage of withstanding a great deal of abuse.

Proper Fixtures to Use

Now let us consider the ordinary common lipped urinal as installed in most of the tourist hotels, are they not the most foul smelling and repugnant of any plumbing fixture, and why? Usually the man responsible for their care will clean the part exposed to plain view, but neglects the other parts, hence the collection of uric acid, etc.; therefore a urinal should be installed which is self-cleaning in all its parts, hence I am in favor of a glazed porcelain urinal stall, thereby dispensing with the lipped urinal.

Standard makes of bath tubs, porcelain lined, roll rim, I consider answer

every purpose for this class of work, provided the nickel plated trap is set above the floor, and finished with drain cock in addition to trap screw of ample size to facilitate drainage for winter season.

Lavatories I consider a matter of choice, while of course they should meet all sanitary requirements, as in the case of bath tubs. N. P. traps should be installed with a view of properly draining them for the winter season.

Sinks are one of the problems to be worked out. Porcelain lined is out of the question, due to the porcelain chipping off; wooden sinks lined with sheet lead or copper seem most in favor with the hotel managers, as there are not so many dishes broken in them; however, it is needless for me to express my views on a wooden sink. At the soldiers' barracks we use a galvanized steel sink which is made to order, and from my observations they fill every requirement and in my estimation they would answer equally well for the tourist hotels.

If the tourist hotel proprietor would hire competent plumbers to drain and prepare his plumbing for winter, he would have much less repair work to do. Install the best of plumbing, even if it is only used for the summer months. Temporary plumbing should not be tolerated, it is dangerous, inefficient, and in the end, very expensive.

THIS YEAR'S WATERWORKS CONVENTION.

At Toronto last year, Milwaukee made a strong effort to secure this year's convention of the American Waterworks Association; but Washington won the honor. The Milwaukee people immediately proposed that the selection of that city be made unanimous, but announced that they would be on hand this year to renew the invitation for the convention of 1909.

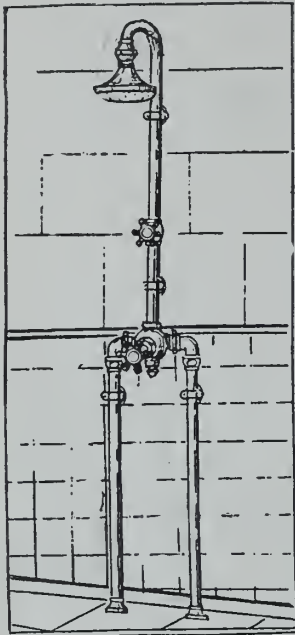
Milwaukee has every facility for the holding of a successful convention, and as the association has been meeting for several years in the east, it would now seem the logical plan to select a city centrally located like Milwaukee.

The Hamilton city council has awarded the plumbing, gas-piping and steam-heating for the new fire station to Adam Clark & Co., whose tender amounted to \$1,547.

Shower Baths in Public Institutions

Details of Showers Installed in Bath¹Houses as Described in a Bulletin of the
U.S. Bureau of Labor.

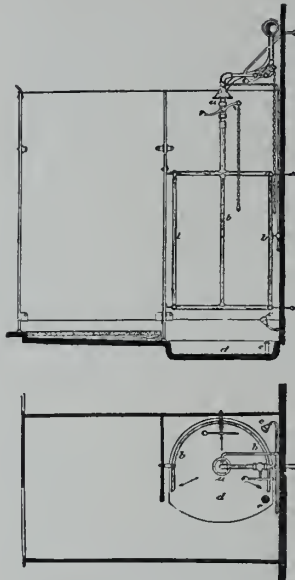
The development of the shower bath has been brought about largely through the recognition that by the use of this appliance a great saving of water is accomplished. A typical shower used in



SHOWER BATH DETAILS, FIG. 1

one of the New York public baths is shown in Fig. 1. These showers consist of an overhead douche or ring, the water supply to it being controlled by a non-scalding mixing valve, so arranged that in turning on the water the cold is turned on first by one turn of the wheel; the second turn of the wheel opens the hot-water supply port, this giving the user the hot and cold water

mixed ; the third turn of the wheel gradually opens the hot-water port to its entire capacity, and gradually closes off the cold. This is arranged in this way so that the bather can get the hot water at a high temperature if desired. To turn the shower off it is then neces-



SHOWER BATH DETAILS, FIGS. 2 AND 3—LONGITUDINAL SECTION
AND GROUND PLAN OF DRESSING AND SHOWER CABIN

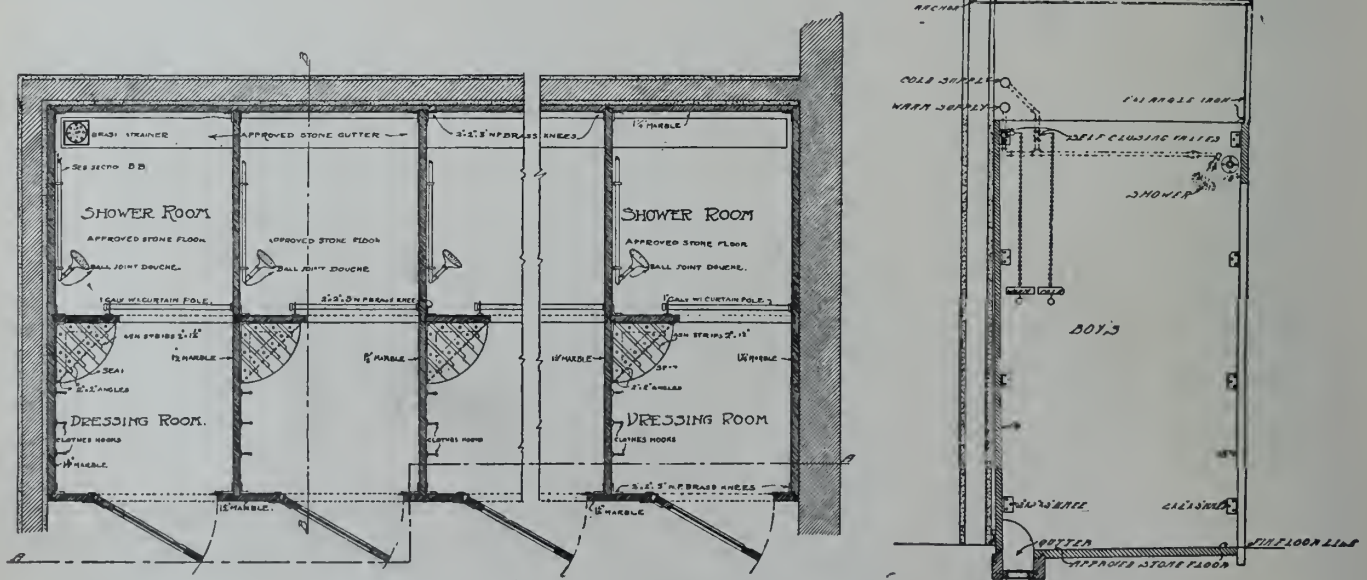
sary to turn back the full three turns, so that when opened up again the cold water will always come first.

A model bathhouse of the Berlin Society for People's Baths, Berlin Industrial Exposition, is shown in Figs. 2 and 3.

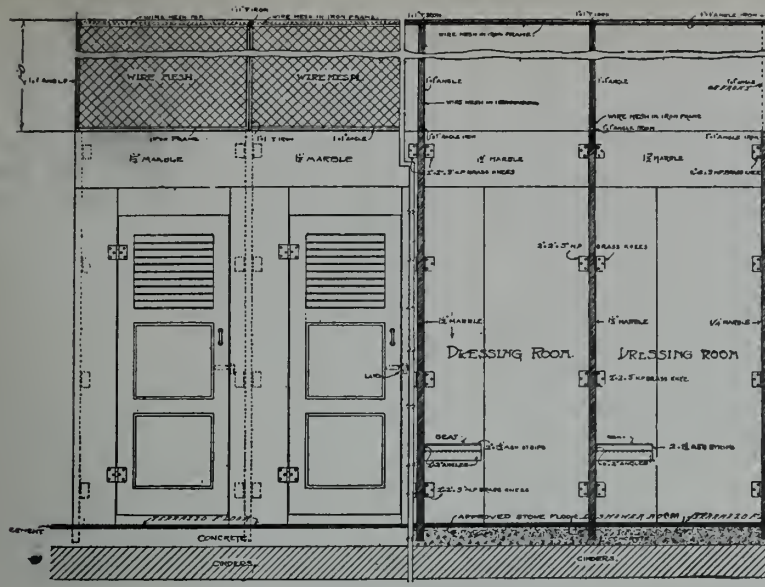
The shower bath exhibited in Figs. 2 and 3, renders it possible for the bather not only to supply himself with water

from overhead, but also, by means of the three side pipes (marked b in the plan) of the so-called "inantele" shower (needle) bath, and by means of an obliquely placed under-shower, to spray himself from both sides and below. Each of these three devices is placed under the control of the bather by a special contrivance. The bather stands in a depression in the floor, which forms a foot tub (d), which, when the showers are opened, fills with water that covers his feet as high as the ankles. The surplus water runs off through the overflow pipe (e). After the bath the overflow pipe is taken out, whereupon the foot tub completely empties itself. The overhead shower (a) has a cold water supply with a separate cock, by means of which the bather can lower the temperature of the water at will.

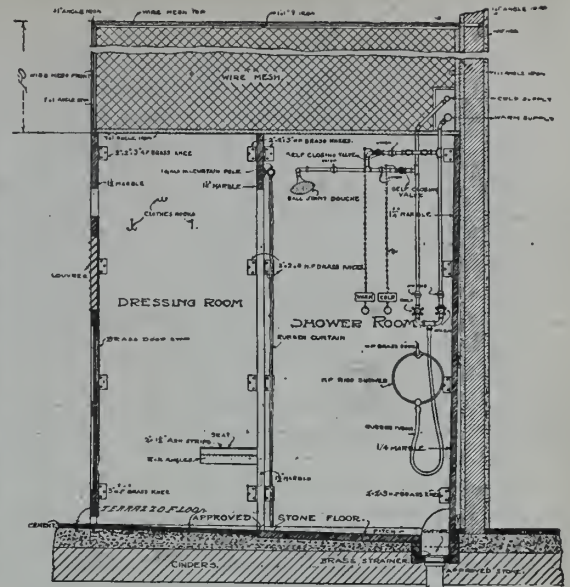
Figs. 4 and 5 show the plan and details of a typical shower bath as at present installed in the New York schools, while Figs. 6, 7 and 8 are a plan and sections of double showers. Mixing chambers are provided, one for each tier of baths, which are connected with the main hot and cold water supply pipes with branches of the necessary size and provided with gate, loose key and check valves, and unions on the branch supplies. The mixing chambers are arranged with automatic devices, thermometers, etc., so that the water delivered at the showers will have a temperature averaging from 80 to 85 degrees Fahrenheit. The delivery pipes from the mixing chambers to the shower are extended to each tier of baths independently, with the branches for showers and connections made at the chambers with brass gate valves and unions. Connections are also made with the main cold-water supply line and a branch extended for each tier of baths with a gate valve on each line. These



SHOWER BATH DETAILS, FIG. 4—PLAN AND CROSS SECTION OF SHOWER ROOM



SECTION ON LINE A-A



SECTION ON LINE B-B

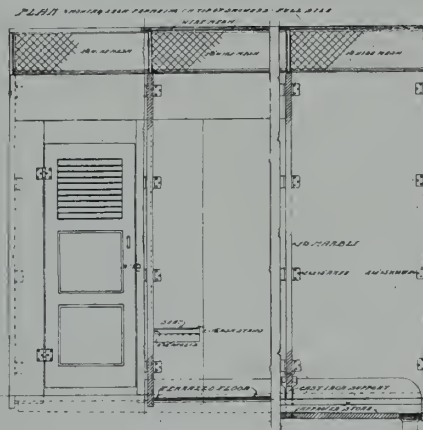
SHOWER BATH DETAILS—Fig. 5.

cold-water lines connect into the branch warm-water supply pipes in each individual apartment for a separate cold-water supply to the shower.

The pipes from the mixing chamber are of sufficient caliber to properly supply all of the bath compartments in case all of the showers should be operated at the same time. The branch warm and cold water supply pipes in the bath compartments are supported and secured in place by malleable iron straps, secured to the marble with brass expansion bolts.

In the several compartments nickel-plated brass showers are provided, which are supplied with warm and cold water through $\frac{3}{4}$ -inch pipe branches by rapid opening valves. In addition, nickel-plated ring showers are installed, provided with extra heavy rubber tubing secured

to the threads at both ends with nickel-plated loose straps. Nickel-plated brass hooks are also provided in the compart-

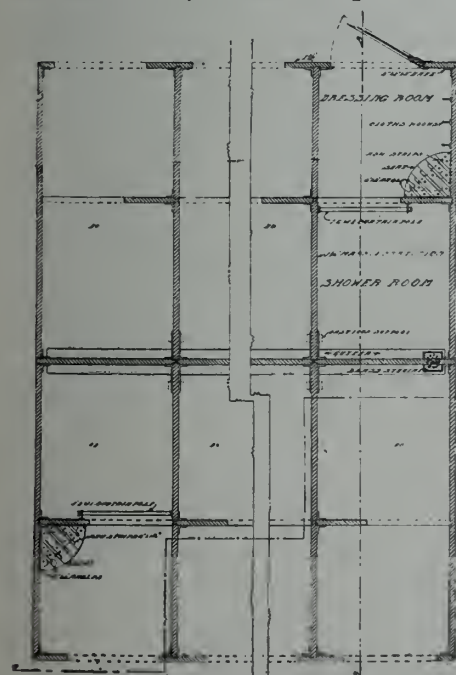


SECTION A-A

SHOWER BATH DETAILS—Fig. 7.

The shower bath partitions are constructed of polished "Tennessee" marble, the front partitions or slabs being secured to the ends and intermediate partitions by nickel-plated brass angles and bolts, washers and cap nuts. The back slabs of the bath compartments are secured to the walls at the back of the slabs with brass expansion bolts, the heads of the bolts being counter-sunk into the slabs and covered. Stone floor slabs are provided, graded in such a manner as to take the water to the gutters. The waste troughs of the showers are also of stone and are connected to the branch drains by means of 3-inch cast-iron pipe, traps and special waste fittings, and have 2-inch galvanized wrought-iron vent pipes.

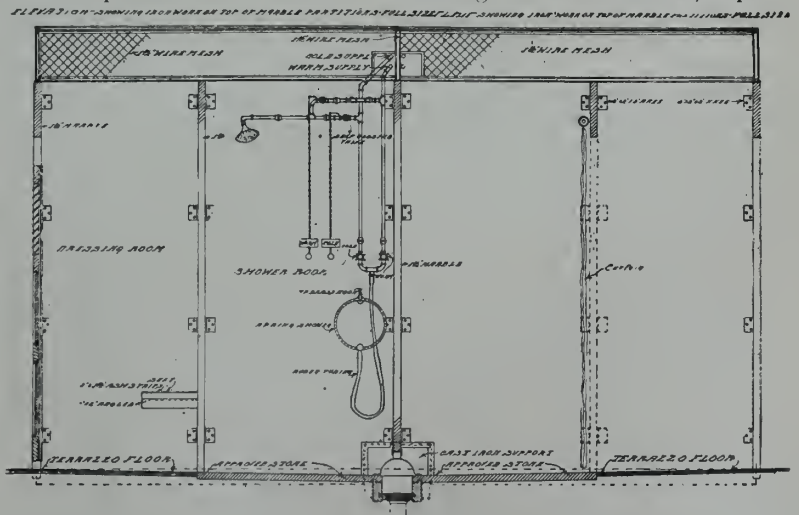
The entire top of the bath compartments, fronts above doors and intermediate partitions, are covered with No. 12 wire $1\frac{1}{2}$ inches diagonal mesh, made up in channels, which is made removable. The mixing chambers in the bath inclosure are also inclosed with wire, having a wire mesh door, top and sides.



PLAN OF SHOWER BATH

SHOWER BATH DETAILS, FIG. 6

ments for hanging up the showers when not in use. Each compartment is also provided with a heavy canvas curtain 36 inches wide, extending from the floor to the curtain pole.



SECTION B-B

SHOWER BATH DETAILS—Fig. 8.

Evolution of House Ventilation

The Fourth Article by E. D. Sidman in Building Management.

We have shown in a brief manner how office and public buildings can be ventilated. Schools, in some states where there is a proper law and politics do not control the school board, and in our larger cities, have fairly good systems of ventilation. Although several pages could be written on the subject of school house heat and ventilation, that would be interesting reading to the taxpayer, but would be of little benefit so long as our schools are in politics. Manufacturers found out some time ago what the employer of office forces is just waking up to, that ventilation is a very profitable investment, for the reason that their employes can and do accomplish more work in the pure air furnished by ventilation than they ever did or could in a room full of foul dry air, and that the loss caused by absence through sickness in their employes has been reduced from 50 to 90 per cent., and even higher than this has been shown where the employes were mostly women. Therefore modern factories as a rule are well heated and ventilated. Theatres and churches have lately made efforts toward ventilation which, even if crude and inefficient, will work out right if followed up. This practically leaves our homes the only buildings where no effective effort has been made toward proper ventilation.

It is a queer situation and a sad commentary on our scramble for existence that the home, especially in this country where it is held in such high esteem as the bulwark of the nation, etc., where our mothers, wives and children spend nearly twenty-four hours per day, should be neglected in this, one of the most vital necessities of life, and that, on an average, not one home in a hundred is properly heated, and not one in a thousand has any pretence of ventilation.

Under these conditions is it any wonder that our wives lose their bloom and sweetness we so admired in them as sweethearts, grow peevish, nervous and run down, when we allow them to exist (not live) in a close, polluted atmosphere, and add to that the cares and worries of married life.

Serious Effect on Health.

Is it any wonder that so many of our town and city bred children are puny, fretful little bodies that can be scarcely taken out of doors in cold weather, for fear of their catching cold, with its danger of complications; or that a large percentage of tuberculosis is developed from the conditions of our homes, which should, beyond all places, be the most

hygienic and sanitary? Yet it must be said to our shame as men and heads of families that this is the condition in the great majority of our homes.

The first thing to be done in our homes to bring about a better condition, no matter how they are heated, is to stop overheating our living and bed rooms. Therefore a thermometer is almost as essential as the heating apparatus itself. Where stove heat is used this will require some personal attention and care, but the result will amply repay it. With furnace, hot water or steam heat, in all cases a thermostat should be used, and under ordinary conditions the temperature in the living rooms should never be above 72 degrees Fahr. If the directions regarding humidity are carried out, it will be found that a temperature of from 65 to 68 degrees is entirely satisfactory for comfort, and a considerable saving in the coal bill.

The next step is to always have the humidity in our homes as near normal or outdoor conditions as possible; to determine this, each home should have a hygrometer, or, preferably, a hygrodeik, as they are more reliable and easier understood, and use it. In stove-heated rooms use the old-fashioned but serviceable open pot, pail or can filled with water and set on the stoves. On the ordinary base burner you can have an ornamental can made to set in between the stove and pipe if desired, or on the stove pipe of any stove can be fitted a round humidifier with a perforated top. Keep these filled with water, and use enough of them till your hygrodeik shows from 60 to 65 degrees of humidity.

Automatic Humidifiers Recommended.

If your home is heated by a hot air furnace and you are the owner, equip your furnace with an automatic humidifier of the right size, and your proper degree of humidity is assured. If you are a tenant, and your landlord will not go to the slight expense to put you in a humidifier, keep the water pan in your furnace full of water, and hang a small bucket or can full of water under each register, and keep them full of water, till your hygrodeik shows you the proper amount to use for best results. Meanwhile it would be a good idea to look up other apartments having a more liberal or humane landlord. Where your home is heated by either steam or hot water, and whether you are owner or tenant, equip your indirects (unless you use washed air) with a perforated pan humidifier, which is

not expensive, and is so made that while it will furnish a large volume of moisture to the air, it will not interfere with the heat. In connection with the indirects, or in homes where there are no indirects, use a sufficient number of either shield or knapsack humidifiers to get proper results, the shield form being preferred, as it is more tasty and ornamental and prevents the discoloring of walls and curtains caused by hot water and steam.

Last, but first in importance, comes ventilation. As was shown in the last article, all ventilation must begin by removing the foul air. Homes with fireplaces, whether built solely for ornament or for use, have in each a first-class exhaust vent if properly used, especially so where several rooms open into those containing the fireplace. If the fireplace was built for ornament, the top of the flue should be capped with a non-down draught vent head, then in homes heated by stoves or hot air, a light fire of paper or shavings, built in the fireplace or flue, will start the draught upward, and the exhaust vent is completed, and will do fairly good work, though care must be taken to repeat this operation every time the house has been allowed to get cold. Much better results can be obtained where the fireplace can be used, as a light coal fire or the heat from a gas log creates a strong updraught. In homes heated by steam or hot water a positive updraught can be maintained in the fireplace by running an aspirating pipe up the flue, properly run so, it will circulate.

Window Ventilators.

The living rooms in homes built without vent flues and heated by stoves will have to depend on window ventilators and the fireplace for fresh air and ventilation, and, where there is no fireplace, on the ventilators alone. Where possible place the window vents so as to get cross circulation, by putting a small vent in two windows placed opposite or at an angle to each other in each room, which will furnish sufficient air; if this is not possible, there should be two vents of a larger size distributed in two windows as far apart as possible. This method of ventilation is more expensive in fuel than where you can use aspirating vent flues, but will be found worth the price in health and general comfort in the long run.

In homes heated by hot air, in addition to the fireplace, if there is one, if not, build more or large flues at the baseboard of the lower floor (in a cottage heated by hot air the same method of ventilation will have to be used as in a stove-heated house), a proper number of vent flues can be made by utilizing the space between the studding next to

the hot air pipes running to the upper floors, letting these pipes furnish the heat to create the updraught, by boring a few small holes through, or by cutting away a piece of the plates, these flues can be extended from floor to floor into the attic, where they can be bunched into one, or be carried singly through the roof by means of tin or iron pipes, in all cases putting a non-down draught vent head on the top, put in suitable sized registers in the baseboards, and your foul air vent flues are complete. This flue, being formed by the space between the studding and lathed and plastered both sides, is practically air tight. The writer has used and seen vent flues made as above used with good success for years, though the first time he was obliged to utilize this space for a vent flue, which was in an old hospital a number of years ago, he was really more surprised at the results than the mechanics that built them and had ridiculed the idea. One bedroom at least should have an exhaust vent for cases of sickness. When the above exhaust vent flues are completed and working it will be found that the fresh air intake to the furnace can be run outside of the house for its supply, and that the air currents will not change, no matter from what direction the wind blows, but if this change should not be convenient to make, or be too expensive, a window ventilator in each room will furnish an abundance of fresh air.

In homes heated with steam or hot water, the above scheme for foul air vents can be used with even better success than with hot air by running an aspirating pipe to near the top of each vent, run so it will circulate. If there are indirects, or direct-indirects, in the house, a good supply of fresh air can be brought in through them, and if the house is so arranged that a number of rooms are open into each other, they may furnish all the fresh air necessary when stimulated to circulate by the foul air vents; if they do not furnish enough fresh air, or there are no indirects, use window ventilators.

Air for Sleeping Rooms.

Now a word regarding the proper ventilation of sleeping rooms. Although at least one sleeping room should have heat, exhaust vent and fresh air intakes, and be independent of the rest of the house to use in sickness or for very old and feeble people, as a rule, for good health, sound sleep and that fresh young feeling in the morning, all heat should be shut off a sleeping room at night and the pure air let in practically unrestricted. This cannot be done by lowering a window from the top; the window should be opened from the bottom. But as this has its drawbacks in giving free access to burglars, or if the wind blows at all hard, creating a

draught, and if it storms allows it to enter and do damage, or else chasing us out of bed "clothed in the chilly garments of the night" to shut them, it is preferable to use window ventilators of ample size. They are the ideal thing for this purpose, having a diffusion box inside that deflects the current of air upward so that there is no draught, and a storm-proof hood on the outside so that neither snow nor rain can enter; these hoods are equipped with cleanable screens, which prevents insects or dust from blowing in. The windows can be as securely locked as ever, and the ventilators are an ornament and inexpensive.

Now hear the "howl," "I can't sleep in a cold room," or "I am so delicate." How do you know you cannot sleep in a cold room—have you ever tried it? If you are delicate, that is one of the best cures known. "But how about the babies?" Well, how about them? Wasn't the older generations healthier than this, and didn't they all have cold, pure air to sleep in? Which is the healthier, the "hothouse" child or that of the poor, who do not even know the smell of a warm sleeping room? Pure, cold air never harmed anyone, but, on the contrary, is saving lives and rebuilding debilitated systems every day. Cover the little "tots" up to the nose, keep them out of a draught, and watch how sturdy they grow when nurtured in their sleep by nature's pure air. Dress them in a warm room and keep your living rooms at an even temperature (this is one of the very best points about the thermostat), and colds, croup, sore throats, etc., will disappear like magic. But if you won't you won't, in which case keep your heat on but both the foul and fresh air vents wide open.

Automatic Steam Vacuum System.

Time and repeated tests have proven beyond question that the most economical and satisfactory heat for flats, cottages or any residence is the thermostatically controlled automatic steam vacuum system. It is the heat we should recommend for this use, and it should appeal to the manager, owner and tenant alike, as it is the most economical system in fuel known, which the owner of his own home, the manager or owner who furnishes heat, and the tenant can all appreciate, and as the temperature in each house or apartment is controlled by a thermostat, it reduces the janitor's duties to putting in the coal and taking out the ashes, so that there is no freezing out of the rooms part of the time and roasting the balance of the time that is usually the case in the other systems of heating that are entirely under the janitor's control. This is the point that should appeal to the manager or owner that leases the build-

ing outright, as he can hold his tenants longer and get more rent for premises with a heating system that is economical and satisfactory than with one that is not. The first cost for this system is about double that of a hot air furnace, 10 per cent. more than ordinary steam and about 25 per cent. less than hot water, while the economy in fuel runs approximately as per the table given in the January issue.

In all detached residences and cottages there should be at least one stack of indirects, either in the hall or parlor; the fresh air to this should either be washed before passing in or a pan humidifier be used for humidity. The radiators in the living rooms should be direct-indirects, and should invariably have a storm-proof hood over the fresh air intake, with a screen that will prevent the entrance of insects or dust, and be easily taken out and cleaned. The bed and bathrooms should have a direct radiator, and the fresh air be brought in through sash ventilators as described in office ventilation. With this system of heating there is no need of valves on any part of the system except the bedrooms, as the thermostat controls the heat. In flats or where indirects are not used, all the living rooms should be heated with direct-indirects. By bringing in the fresh air direct by the above means we of course increase the natural amount of humidity in the rooms, and by the use of a few shield or knapsack humidifiers it becomes a very easy matter to keep the relative humidity at the normal.

Exhaust Vent Flues in Walls.

In the inner partitions build your exhaust vent flues of tin or galvanized iron, running them up through the roof and capping them with a non-down draught vent head, run in each a suitable sized aspirating pipe from the heating system, which, with the vacuum system, will have to be capped on top and have a proper working air valve piped back to the seal; put proper sized registers in these vent flues just above the baseboard, and if desired, a larger register may be placed in the flue just below the ceiling for summer use. In most all cases the vent flues can be placed where they will open into two or more rooms, which will save expense in both flues and aspirating pipes. With this system of ventilation a proper amount of pure air is assured at all times, at a very small expense, and the system is under complete control in every room.

Summary of points to be remembered and followed to give us hygienic homes and to bring to us at all times the practical benefits of an outdoor life: Do not overheat your rooms; sleep in cold, pure air; carry off through proper vents

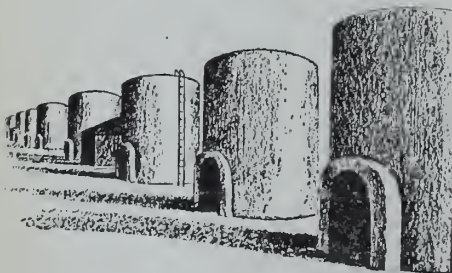
the foul air in the rooms; bring in through vents that will prevent draught the right amount of fresh air; increase the humidity or moisture in the inside air to the normal.

Results: Economy in fuel, as it is easier to heat fresh air than foul air, and with the proper degree of humidity the temperature need not be as high, or in other words, water is cheaper than coal; saving of lives by preventing tuberculosis and other throat and lung troubles; the improvement of the general health and the abolishment of "nerves;" the ability through the above to do more work easier and better, and thus increase our earning ability; the general increase of contentment and happiness in our homes and lives, for he who is healthy is happy. And in general, when combined with the vast strides made in medical science in late years, so that diseases, formerly sure death, are now cured or prevented, and with the decrease in infant mortality due to modern sanitary arrangements, efficient health officers and pure food laws, should and will increase the general longevity of the human race many years.

Why then is it that this important question of ventilation is so universally ignored? It cannot be the expense, as that is less than many of the items that go into our buildings for ornament alone. Neither can it be that health is of no account to us. Therefore it can only be due to gross ignorance, or that we are more willing to wallow along in the rut we are in than to exert ourselves to get out of it, no matter what the reward may be.

STORAGE OF FILTRATION SAND.

An important and absolutely new feature of the immense filtration plant at Washington, D.C., which in itself is a

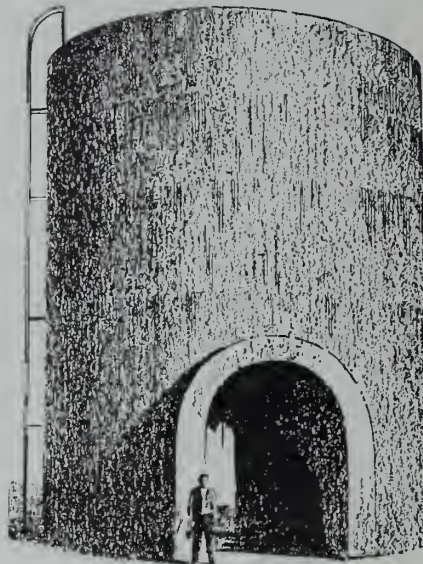


Series of Bins in Washington Filter System.

concrete city covering more than 29 acres, are the massive concrete sand bins, 29 in number, which form a part of the sand washing system.

These bins are used for the storage of sand after it has been washed and before it is returned to the filter beds. From the washer the sand is carried, suspended in water, through pipes and into the bins. The proportion usually

flowing in is four parts water and one part sand. The sand sinks to the bottom and the water accumulates until the bin is half full. At this level the water overflows through a pipe, and continues to overflow until the sand reaches the outlet. The gate at the first



Immense Sand Washing Bin.

outlet is then closed, and the process is repeated by the use of a second outlet near the top of the bin. Each bin holds 250 cubic yards of sand.

The bins are of massive construction and tower 32 feet into the air. The diameter, outside measurement, is 23 feet 6 ins., and at the top the outside wall is 9 ins. thick. They are supported on circular concrete foundations, carried below the frost line. Their great weight, to which is added the weight of the wet sand, is carried partially on the outside wall and partially upon three circular arches. These arches intersect at the centre of the structure, and leave a space underneath large enough for a 2-horse cart to enter. At the intersection of the arches there is a heavily constructed gate, through which the clean sand is allowed to pour into the wagons. From the wagons the sand is dumped through manholes upon revolving chutes, which scatter it quite evenly over the surface of the filter. At other filters, where there are no concrete sand bins the washed sand is heaped up in the courts and must be shovelled into the wagons by hand before it can be taken back to the filters.

At the Washington plant the dirty sand is also handled in the easiest manner possible. Laborers scrape it up from the surface of the filters and throw it into ejectors, whence it is forced by water pressure through a series of hose and pipes into the sand washers in the courts.

The 29 bins cost \$60,800, but this expenditure has been justified. The average cost of handling a cubic yard of sand by this system is about 42 cents,

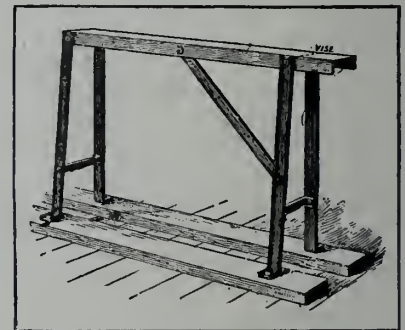
according to Popular Mechanics, while the cost at other plants runs from \$1.38 to \$1.70.

STOPPING A LEAK IN A GAS HOSE.

Recently the gas hose connecting a hot plate sprung a leak and by applying a lighted match the seam was found to be about 3 in. in length. The repair was made quite easily by applying two or three coats of shellac varnish.

PIPE-FITTERS' KNOCK-DOWN BENCH.

A form of knock-down bench suitable for the work of the steamfitter is illustrated in the accompanying sketch. The bench is comprised altogether of metal, in the form of channel irons. It is light and at the same time rigid. When partially taken apart it can be folded into little space, to be carried from or

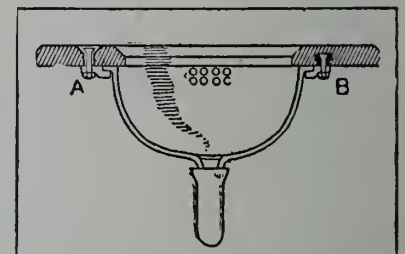


Pipe Fitter's Knockdown Bench.

about a building, says the Metal Worker. The top of the bench is made from a channel 5 ft. long and 8 in. wide.

FASTENING CLAMP BOLTS ON A LAVATORY.

A basin of a lavatory is held up by three or four clamps fastened to the slab by bolts leaded into holes drilled in part way, as shown at B in the sketch. When these bolts loosen and



Fastening Clamp Bolts on a Lavatory.

come out it is hard for the repairman to lead them again so they will hold. To make a good holdfast job drill the hole through the slab as shown at A, countersinking the top for the head of the bolt. After the bolt is put in place the hole is filled with plaster.—Mechanics.

WATCH THE CHIMNEY.

When in order to meet owners' ideas as to cost of a home it is necessary to modify a set of plans, don't economize on chimney.

More disappointment, dissatisfaction and inconvenience can be caused by an improperly designed flue than by any other mistake in a building.

We often hear of a furnace, range or water boiler having a good draft. This is wrong—the chimney has the draft—and upon this depends in a very large measure the efficiency of your heating plant and consequently the comfort of the occupants of the building.

Terra cotta flue lining is often cut out of specifications. This is a mistake and saves practically nothing, as with lining four-inch walls are proper, and without lining eight-inch walls are necessary; also close supervision to see that joints are cut neat and smooth. In some localities it is the custom to plaster inside of flue. This is not good practice as a smooth job is very hard to get and the plaster is always falling off. A clean out door, 8 inches by 10 inches, with frame made of cast iron set in bottom of each chimney, is worth many times its cost.

Frequently the flue of an open fireplace is carried into the main flue. This is a serious mistake. The flue should be straight; have no openings of any kind, except to furnace. Use entirely separate flue for fireplace or ventilation. The best flue is an oval or round one, but owing to excessive cost is seldom used. The general shape is square or rectangular. Of these the square is the best, as it affords less friction; but for an ordinary dwelling an 8-inch by 12-inch flue should be the smallest used, and no recess panels or ornamented cap that reduces the opening in any way should be permitted, as the chimney is no larger than the diameter at its smallest part. It should be built higher than the higher point of roof in order to prevent down drafts.

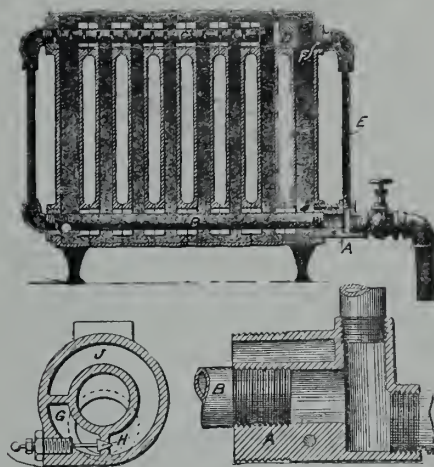
To illustrate the importance of a chimney a correspondent tells of a builder who had racked a chimney between cellar and first floor about twelve inches, and in laying the brick the diameter of flue was reduced. This was overlooked; and after the heating plant was installed, the flue was tried by lighting newspaper, which apparently proved draft to be good. When winter set in the heating plant wouldn't heat the house. The chimney was raised, boiler and pipes covered with asbestos, and still did not produce results. The heating contractor was put to great expense, the owner dissatisfied, and had it not been this house was part of a building operation, and exactly the same plant was working all right in a dupli-

cate house, a new heating plant would have been demanded.

Eventually the trouble was discovered and remedied by rebuilding the bottom of the flue. This small error caused such a great deal of trouble that we urge you to watch the chimney.

COMBINED STEAM AND HOT WATER APPARATUS.

The accompanying illustration shows an invention which seeks to combine the advantages of hot water heating with those of steam heat. As is well known, hot water systems cannot be used in tall buildings, owing to the enormous pressure which would be developed in the pipes. The present invention, however, aims to use the steam for distributing the heat, while the water is used in each radiator merely to retain the heat. The radiator is of the usual form and is provided with a main fitting A. This connects at one side with the steam supply pipe, while at the opposite side a pipe B extends through



Combined Steam and Hot Water Heating Apparatus.

the lower portion of the radiator. A vertical pipe at the rear end of the radiator connects the steam pipe B with a condensing pipe C in the upper part of the radiator. The condensing pipe is formed with openings to permit the water which is condensed from the steam to drip out into the radiator. The end of the pipe C is closed by a plug, and a plug D just beyond the pipe C partially closes the front section of the radiator from the other sections. The water of condensation is trapped in the radiator, and rises to a point near the top, where a valve F carries off the surplus through a pipe E to the fitting A. The interior of the radiator opens into a chamber J, as shown in the cross-sectional view of the fitting A, and this is separated from the chamber G by a valve H. In use the steam passing through the pipe B heats the water in the radiator, and the heat from the water is given off slowly and uniformly,

as in the usual water heater. On opening the valve H, the water in the radiator passing through the chamber J is permitted to enter the chamber G, whence it is drained off through the supply pipe of the radiator. The inventors of this heating apparatus are Alexander Zeek and Frederick Van Zeek, of Grafton, W. Va.

METAL WOOL FOR JOINT CAULKS.

A method recently introduced of making lead joints for gas and water pipes, says December Light, is claimed to possess a number of important advantages over the old methods. Formerly, and as most of our readers know, joints for gas and water pipes have been generally made by first introducing into the socket strands of hemp yarn, then filling the space left with molten lead, afterward calking the latter. In cooling, the molten lead contracts and a space is left between the lead and the wall of the socket, and it is to close this that the lead ring is calked, but, as experiments have shown, this spreading of the lead only takes place for a very short distance down into the socket, leaving the bulk of the lead doing no useful work.

It is of course necessary in the use of molten lead that the pipes should be perfectly dry, and much difficulty and many accidents have been caused and expense incurred through the blowing of joints owing to the presence of moisture, and this constitutes a formidable difficulty when pipes have to be laid in wet ground.

The new method of making the joint it is claimed, avoids all the disadvantages above mentioned, and has other advantages of its own. In this newer method a patent "lead wool" is used, and this consists of fine threads of the purest virgin lead cut by patent machinery, and in such a way that it will weld together when hammered.

After the introduction of the usual hemp or yarn (not tarred), this strand of lead wool is twisted until it fits the space in the socket. It is then well calked, and this calking is repeated with each turn of the lead wool until the socket is filled and the whole of the lead wool is tightly pressed into a dense mass of lead, whereby not only a safe and efficient packing is obtained over the entire depth of the socket, but the joint is capable of withstanding a much greater pressure than the joint made in the ordinary manner, state the manufacturers.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

OBSOLETE PLUMBING REGULATIONS.

Sir,—It was no surprise to me to find that a plumber was discovered putting in dummy vents, neither was it any surprise to find the Plumbing Department unwilling to give you any information in connection with this case. Let us look into some of the reasons for bad plumbing work and see if the official Health Department is to be held responsible to any great extent.

Toronto is growing very fast, it is becoming metropolitan, and, in some respects, congested. Have the sanitary arrangements and the method of enforcing them kept pace with the changed conditions? Are we not using the same plumbing by-law and the same literal interpretation of it, as used 15 years ago, while employing about the same number of inspectors and the same few in the clerical department?

Have we any machinery to detect the mean part of the public who take advantage of an ignorant plumber and suggest that he can do the work without any plumbing inspection, all that he has to supply is labor, the owner supplying all material, also impressing on the plumber that he (the owner) will become responsible for results which he generally does by demanding an increase in rent for supposed sanitary improvements. Then if by accident the plumber is discovered, of what use is it to fine or jail him. Why not use a little common sense and fine the man who has made the money?

Everything in connection with the Plumbing Department and license system is so easy and foolish that any man or child owning \$1 and a quantity of nerve can become a master plumber in five minutes and then show by his method of doing business that he should never have received a license until he became more proficient.

What is it that takes up the most time of seven or eight men in the Plumbing Department? Is it the man that tries to do an honest business and do it according to our antiquated plumbing by-law? Or is it the man that makes bolt joints, that back vents too low, does not put in large enough pipe, or fills the soil pipe joint with things not lead and oakum?

How many times is it necessary for inspectors to visit work installed by poor mechanics? Is the Health Department merely to pass on plans and specifica-

tions, and then call and see the work when a notice is received, and then not able to attend to the notice for three or four days, keeping work delayed, and, in some cases, finding work covered up when they call to inspect it, the contractor refusing to lose any more time waiting on such a system?

Does it not rest with the Department to suggest changes in the plumbing by-law, and in the method of granting licenses? Surely they must be more familiar with what is necessary with their years of experience with all kinds of work and men than the average plumber who has not the time to devote to public questions or advanced sanitary changes in law that should be controlled by the Board of Health or the Plumbing Department?

Do you think that our Smoke Testing Department is anything more than farcical? Suppose after applying the smoke test everything is tight with the pressure obtainable, there is a leak at breather or the drain connection is not tight, after the report has been made, has any person power to direct any further method to rectify matters? Have we not a conglomeration of plumbers, drainmen, inspectors, architects, owners, buyers and sellers, not one that can actually be held responsible to remedy matters?

Has the Department any power to compel property-owners to put their houses in a sanitary condition?

Have they no power to compel factory-owners to provide sanitary accommodation?

Do they not know that all over this city (and particularly in the City Hall district) that one hopper or two-piece closet, and sometimes a straight drain pipe with a tapered tile is the only accommodation for 10 to 30 men, women and children, the owners of this property receiving 30 per cent. and more in return from rents?

Do they not know that clothing factories and restaurants have closet accommodation absolutely filthy and obscene that men and women are forced to use not knowing who should be responsible and not able to find out?

When a complaint reaches the department do they send a man to investigate the trouble, capable of understanding what is necessary to be done and able to report back in an intelligent manner? And when the report is received has the Department the machinery to order necessary changes and com-

pel them to be carried out in the interests of the city health?

Do not the present inspectors understand that they are there solely to interpret the plumbing by-law according to the statute and not according to the highest degree of proper sanitation?

Do the inspectors look upon their positions as giving them power to find fault only and pass work that is according to the letter of the law? Or do they realize that they have some power of initiating and some educative ability that could influence the powers that be to help carry out a policy that would be in the interest of the whole city, and to rectify wrongs in the plumbing business which every man that is engaged in the business knows to exist in no small degree?

I am sure that generally we have capable men on the inspectors' staff and exceptionally good men in the clerical department, but if they are limited by methods in force for fifteen years, of what real power have they to-day?

PERCUSSION.

Toronto, April 17.

CHEAP WORK AT HAMILTON.

Sir,—We see by the last issue of Plumber and Steamfitter that one man has been hauled before the court for doing bad plumbing work in Toronto and think we could point out a good lot of such work right here in Hamilton.

The writer was asked to figure on putting in two closets in the thickest settled part of the city. The owner wanted them put in the cellar, with 4-inch quarter bends into the tile sewer—just set the bowls in the quarter bends. There was to be no vent through the roof and these are in new houses.

In another case we were called on to figure for a new house to have 5-foot east iron enamelled bath tubs, low down closet, enamelled iron sink, 4-inch light soil pipe from sewer to the closet and 4-inch galvanized iron pipe, No. 16 gauge, from the closet through the roof.

We could have had the job—but no—and we see the above has been done.

You speak about cost prices, and we will give you a little insight into how some work is being taken here in Hamilton.

We figured on two houses a few weeks ago which were to have 5-foot east iron enamelled bath tubs, with fuller bath cocks, N.P. waste and overflow, low down closet, east iron enamelled lavatory with 8-inch backs and N.P. fuller basin cocks; 18-inch x 30-inch east iron enamelled roll rim one piece sinks and backs, N.P. cocks; 30-gallon galvanized iron range boiler with stand and stops; lawn supply with stop and waste cocks;

40 feet of 4-inch soil pipe for each house; water supply to be run $\frac{1}{2}$ -inch galvanized iron pipe; boiler to be connected to the furnace; all work to be done in a thorough, workmanlike manner. We put in a price for the work and the owner nearly took a fit; the contract was let for \$95, with lead work under the floors.

Another case was as follows: 5-foot, cast iron enamelled bath with N.P. waste and overflow, fuller bath cocks; a good-sized lavatory with fuller cocks, low down closet; 30-gallon galvanized iron range boiler with stand and stop cocks, lawn supply with stop and waste cock; 35 feet, 4-inch soil pipe and necessary brass thimbles; $\frac{1}{2}$ -inch galvanized pipe for water supply, brass stops in cellar; pipe house for gas—16 outlets—connect to the meter, connect to range and gas stove and mantle.

We did not get the job as we were too high. The owner did not take a fit, but claimed we wanted to ruin him. The contract was let for \$126.

Now the above is true, and do you think that there is a city in this Canada of ours that stands in need of sanitary inspection more than Hamilton, and how can good work be done at such prices?

SANITARY.

Hamilton, April 14, 1908.

PLUMBERS AND JOKERS.

Sir,—That plumbers are unjustly made the brunt of many unjustifiable jokes is a well known fact.

Who has not heard the expression, "As long as a plumber's bill"? Is this because the larger share of his work is hidden out of sight and as people cannot see every item that enters into the work they think they should not pay for that part? Haven't we often seen people who pay exorbitant prices for the latest style hat or dress, for flowers and decorations for a social gathering, for some new attachment for an automobile or for a trip abroad, yet when they come to pay the plumber they will kick and refuse to pay till you threaten to sue them and maybe won't pay then.

Some of these very same people if they are sick or even think they may be sick, will go quietly to the doctor that charges the biggest fees and pay any price they are asked, but if they want any plumbing work done will hawk their work all round the town, see who will do the cheapest job, suggest that the work shall be done in such a manner that it violates the most common sense rules of sanitary work, and inspection of their work will never be made as they will never report their work, and will try and save a few extra dollars by

using second quality material and light soil pipe.

Yes, and some of them will go further and buy their fixtures off a department store that sells plumbing fixtures just like calico without any idea as to their fitness or quality, and then hire a blacksmith or a carpenter to put it in, or they may go further and bribe some boy who has worked at the business a few months to borrow the tools and solder from his boss and do the work in the evenings or report off sick to his employer for a few days. Yet the public wants and needs badly good plumbing work, and how are they ever going to have it without the very closest and best inspection under stringent yet sound sanitary regulations.

* * *

When the daily newspaper reporter is running in a few lines about the plumber his head lines are generally so worded to put the joke on the plumber, as was the case in two instances reported in the Toronto papers last week, where plumbers had to sue for their money. In one case the defendant's counsel asked, "Are you a registered plumber?" "I certainly am," replied the witness. "What do you charge an hour?" queried the lawyer. "Thirty-five cents an hour." Counsel was dumbfounded. "What! thirty-five cents? If you would advertise you would be the busiest man in Toronto." "I'm in business for myself now. Do you want any plumbing work done?" was the quick rejoinder, and judgment was given for the plumber.

Over in the States the plumber comes in for his share of the jokes, of which the following may be considered a late sample: "Are you the man from Sodder & Co.'s to do the repairing of the water pipes?" asked Mr. Subbbs. "Yes," replied the plumber, "and Mr. Sodder says it'll cost you \$60." "What, why he has not seen the job; he doesn't know how much I want done." "Mebbe not, but he told me how much to do."

* * *

Whence come these jokes, why has the plumber been selected out of the trades for the major share of them. Or is it as it was with Irish immigrants some 40 or 50 years ago? Then his methods and manners warranted the jokes concerning him, but when he has changed these the jokes have largely disappeared as they are no longer applicable.

Are these jokes nature's method of saying "get wise"?

"SANITAS."

Peterboro, April 16, 1908.

PLUMBING BY-LAWS AND INSPECTION.

Sir,—I have read with interest the articles in *The Plumber and Steamfitter* of April 8 what has been said about bad plumbing, poor inspection and worse by-laws.

Such subjects concern the general public as much, in fact, more, than they do the master and working plumber, as the public at large is the great sufferer by such work, though most likely they do not recognize it and would think that as soon as they were told that better work should be the rule with all plumbing work that there was some ulterior motive that was back of any such suggestions as are set forth.

Doubtless many of your readers remember when lead waste-pipes, with no traps or vent pipes were the rule and not the exception, and after cast iron pipes came into use for soil-pipes that they were erected in a slipshod way (from the present day way of looking at the matter) and supported by hooks, and the joints were made tight (?) with mortar or mud. The only test thought necessary then was that water should pass down the pipe freely.

Probably they also will recall many cases of where the lead waste-pipes were eaten through by rats and the trouble and expense that ensued, not to mention the complaints they received. And again, after the trap was rather thoroughly introduced, and before venting became known, they remember the troubles likewise.

Yet again, they will not forget (and I don't have to refer to my note book) their troubles coming from inspection.

For all this advance, through his past experience, the plumber has been responsible, though all the forward steps that have been taken for the well being of the general public may have been without recognition of his being a really useful member of society.

I know that plenty of us plumbers would be glad that our work should receive the severest inspection in accordance with the by-laws of any city or town and would willingly suggest to those really interested the means of securing still better work, were our knowledge of such work considered essential.

So I say if our inspection by-laws are lax, there is no time better than the present to reconstruct them, or if there are any shortcomings or missing links, let them be supplied by those who know best their necessity.

The public has nothing to lose and everything to gain and the plumber and inspector (if well intentioned) will gain their reward further on.

"VENTS."

Toronto, April 20, 1908.

NEWS OF THE TRADE IN CANADA

Wm. Desermeau, plumber, Montreal, is dead.

The Victoria Plumbing Co., Victoria, B.C., has dissolved.

Wm. McGee, Belleville, was a visitor in Toronto this week.

Primeau, Landry & Co., plumbers, Montreal, have been registered.

R. J. Cluff, of Cluff Bros., Toronto, spent a few days in Montreal this week.

Mr. Enright, a Montreal plumber, has been holidaying at Cape Breton, Nova Scotia.

Brickman & Stoll, plumbers, Stratford, have been succeeded by Brickman & Baker.

C. Lenghen & Fils, plumbers, Quebec City, had their shop damaged by fire a few days ago.

Wm. Crawford, Clark & Crawford, Niagara Falls, spent a few days in Toronto during the past week.

Thorn & Hunt, Toronto, have dissolved. Mr. Thorn continues the plumbing, and Mr. Hunt the hardware business.

Cleator & Green, Vancouver, B.C., have moved to the corner of Ninth and Quebec Avenue, where they are putting in a first-class shop and showroom.

E. T. Lawrence, representing the Art Brass Company, 299 East 134th Street, New York, has been showing his samples to Toronto plumbers this week.

Simmons Bros., tinsmiths and plumbers, Kingston, are having alterations and improvements made to a building owned by them for a new show company.

J. E. Farrell, North Bay, has returned to work after a hard earned holiday spent at Toronto, and his old home in Waterloo County. Mr. Farrell called on The Plumber and Steamfitter's Toronto office on Monday, and promised to write a couple of articles for the paper during 1908.

The Reeder Electrical & Manufacturing Company, Limited, has been incorporated with a share capital of \$60,000, to manufacture all kinds of electric, gas and other lighting and heating fixtures. The head office will be at Toronto, the provisional directors being A. W. Reeder, R. Gowans, A. E. Bowens and E. H. Wilson.

The trade in Toronto is waiting with keen anticipation to see D. McArthur's new motor car as it is understood he intends to outdistance in speed the cars operated by Fred. Somerville, "Bob" Cluff and Joe Wright. A race between this bunch would be a great feature at the National Master Plumbers' Convention, expected to be held at Toronto in August.

In response to the request made by the Kingston city engineer for an assistant to act as plumbing inspector, the

city council decided that they had not enough money to appoint an inspector this year and the engineer will have to perform the duties as best he can. The engineer says he has enough to do, without being called upon to do plumbing inspection.

One of the boilers of the Nicholls Hospital, Peterboro, exploded on April 3, and considerable damage was done. A peculiar incident in connection with the affair was that two window frames were blown from the boiler room 25 feet across the lawn and not a pane of glass was broken. F. J. R. McPherson installed a new boiler the following night, connecting it with the rest of the heating system.

Alexander Mackay & Co., Montreal, have secured the contract for heating and ventilating St. Andrew's Presbyterian Church at Westmount, on their design, using a 8,000 sq. ft. low pressure steam boiler, supplying 2,000 sq. ft. of indirect radiation; also a 100-in. blower fan and electric motor. A separate hot water heating apparatus will be installed to supply the minister's study, janitor's quarters, etc. The firm also has the plumbing contract.

Halifax plumbers are now enjoying a harvest, as the result of the city installing 3,000 water meters which were recently imported from New York. Ten firms tendered for the work, the figures ranging from 55 cents for cup joints, half-inch meters, and the same for 3/4-inch meters for wiped joints. The highest tenders were \$4.75 to \$5.00 for each meter. The tenders accepted were: John E. Myers and W. S. Craig, and they are now installing the meters at the rate of 35 a day.

TORONTO'S NEW ASSOCIATION.

The new Master Plumbers' Association being organized in Toronto is making steady progress, and the number of members is on the increase, according to the officers. Another meeting will be held on Thursday, April 23, to complete the work of organization. R. Locke, 699 Yonge Street, has been elected president and Thomas Norris, 26 Verral Avenue, Secretary. Mr. Norris was formerly in business at Galt, and more recently was connected with the Mashinter estate, Toronto.

While the new organization will have uphill work in working up a large membership, owing to the reluctance of many to again affiliate with an association, it seems certain to succeed in ultimately becoming a strong organization. A wage agreement with the journeymen will probably be one of the first steps taken by the new body. The objection made by the promoters of the new asso-

ciation against the existing Master Plumbers' Section of the Employers' Association, which has a membership of about 40 of the largest firms in the city, is that the older body can see nothing but the one question of the "open shop."

The trade generally will be glad to see Toronto master plumbers get together on any basis and the new association if it is conducted on broad lines, and, in addition to the labor question, takes up an educational campaign to better the class of work being done, secure effective inspection, establish more stringent license regulations, etc., is certain to succeed. Its usefulness will be measured by its aggressiveness on these questions.

LEAD WOOL FOR CAULKING.

John Garde & Co., 142 Victoria St., Toronto, has secured the sole agency for Canada for "Lead wool," a shredded lead yarn for caulking joints in gas and water mains. Work can be done independent of the weather and it is claimed that a joint double the strength of the ordinary cast lead joint can be made. Samples and circulars can be had on application if this paper is mentioned.

UNIQUE SOAP HOLDER.

A peculiar contrivance, termed a soap-holding device, is the recent invention of a Chicago man. It comprises a supporting arm, to which is suspended a chain and clamp, carrying a cake of soap. Obviously the supporting arm is attached to the wash basin so that the suspended cake of soap will be directly over the water. The supporting arm is not stationary, but is pivoted, in order that the soap can be dipped down into the water when necessary. The sanitary advantages of this soap-holder will be apparent at once. It does away with the ordinary slimy receptacle used for holding soap. The soap hangs in a position of best advantage to the user. Soap of any description can be used, as the supporting pin can easily be pushed into position.

The announcement is made that the mid-summer meeting of the American Society of Heating and Ventilating Engineers will be held at Niagara Falls on Friday and Saturday, July 24 and 25. The sessions of the society are always instructive and Canadians desiring invitations to attend should communicate with the secretary, William M. Mackay, New York. There are already a number of members of the society resident in Canada, and the convenient location of the convention may result in the number being increased.

OPPORTUNITIES FOR BUSINESS AND CONTRACTS AWARDED

Building Notes.

Calgary will erect a civic hospital at a cost of \$100,000.

Tamblin & Jones, of London, have the contract to erect a new store building.

The Dundas, Ont., School Board is contemplating the erection of a \$16,000 school.

The Dominion Bank will erect a new building at Hamilton to cost about \$40,000.

The Wesley Methodist Church, Vancouver, intend building a new church to cost \$100,000.

The School Board at Moncton, N.B., are securing plans for a new fireproof school building.

The Winnipeg School Board has practically decided to build another schoolhouse this year.

Hyatt Bros., London, have been awarded the contract for a new warehouse, to cost \$22,000.

Tenders have been called for the erection of the Union Station at Winnipeg to cost about \$1,000,000.

Tenders are being called for by Denison & Stephenson, Toronto, for the erection of a four-storey warehouse.

Tenders have been called for the erection of a new building for the North Parkdale Methodist Church, Toronto.

J. McDiarmid & Co. has been awarded the contract to build the Winnipeg examining warehouse, to cost \$276,000.

Nagle & Mills, Ingersoll, have been given the contract for enlarging the Guelph Armory, the improvements to cost \$40,000.

The Bank of New Brunswick will erect a stone front building at St. John, N.B. The floors will be of concrete steel, with tile finish.

The Edward Partington Pulp & Paper Company, of St. John, N.B., will build a warehouse 90x30. The plans have been prepared by F. Neill Brodie.

Thomas Kelly & Sons, Winnipeg, have been awarded the contract for the erection of the new Nova Scotia Bank building at Winnipeg, to cost \$250,000.

The directors of the B.C. Agricultural Association have decided to call for tenders for a \$12,000 building. Mr. France, of Victoria, B.C., is the architect.

The Imperial Storage Warehouse Company, of Toronto, have had plans prepared for a three-storey building, 40x125. Leonard Foulds, architect, will call for tenders.

St. Thomas building permits for March amounted to \$32,180. The Bell Telephone Co. and Ingram & Davey, hardware merchants, intend putting up handsome business blocks.

The M. E. Keefe Construction Company, Halifax, has been awarded the contract for the erection of the new technical school building in that city, and also for the alterations to the Halifax post office.

Several small houses are being erected in Montreal, but building trade is not nearly as brisk as last year. For the month of March, 1907, permits were issued valued at \$643,621, while for March of this year the permits issued amounted to \$197,683.

Building trade is brisk in Vancouver. The Imperial Trust Company will erect a thirteen-storey block, to cost \$400,000. J. J. Dissette, has taken out a permit to build an apartment house to cost \$30,000. P. G. Drost has prepared plans covering the erection of a carriage manufacturing plant.

Municipal Enterprises.

Orillia may spend \$75,000 for construction of sewers this year.

Port Stanley, Ont., is to vote on the question of installing a waterworks system.

Yorkton, Sask., will issue \$45,000 debentures for the purpose of constructing a waterworks system.

Gloucester Bay, N.S., ratepayers will be asked to authorize the expenditure of \$30,000 for water extension.

Portage la Prairie ratepayers vote on a \$50,000 by-law on April 28, to install and complete an auxiliary waterworks system.

Preston ratepayers will vote on a by-law to raise \$16,000 to construct a sewer system, and \$10,800 for waterworks system.

Victoria, B.C., ratepayers will vote on by-laws to raise \$70,000 for the high water pressure system, and \$50,000 for sewerage extensions.

Saskatoon City Council has passed a by-law to issue \$130,000 debentures, part of which will be spent to complete the waterworks and sewerage systems.

HANDSOME CALENDAR.

The James Morrison Brass Manufacturing Company, Toronto, are supplying their customers with a calendar dated from April, 1908, to March, 1909, the top portion being decorated with three very handsome views done in colors of an engine-room, a bathroom and a sitting-room, each showing to advantage

some of the engineers' and plumbers' brass goods, enamelled and lighting fixtures. Copies of the calendar can be had on request.

A BRASS GOODS ENCYCLOPEDIA.

The new Catalogue "D," of the H. Mueller Manufacturing Company, of Decatur, Ill., is probably the most complete and most expensive catalogue of its kind ever issued, and it is undoubtedly a work of art. It is 11½ by 9½ inches in size, about 3 inches in thickness, is adjustable, and is bound with a fine quality of black leather. The paper is exceptionally fine and the printing is of the best. On the title page appears a photograph of the members of the Mueller firm, with a photo of the founder, Hieronymous Mueller, now deceased, in the centre.

Handsome engravings show the various prizes won by Mueller goods at the various international exhibits, and also their plant at Decatur and their large showrooms in New York. The advertising department of the company has been working on the catalogue for two or three years, the printing being done at Decatur under their direction. Great credit is due them for their work, as both the engraving, the general arrangement, the indexing, the descriptive reading matter, and the listing of sizes and prices is about as complete as human ingenuity could make it.

The most striking thing about the catalogue is the convenient arrangement of the contents. These are arranged in sections, seventeen in all, as follows: Tapping Machines, A; Corporation Cocks, B; Water Connections, C; Lead Flange Work, D; Ground Key Water Cocks, E; Compression Work, F; Fuller Work, G; Self-closing Work, H; Water Pressure Regulators, J; Water Strainers, K; Service Clamps, L; Gas Meter Connections, N; High-Pressure Gas Cocks, M; Gas Meter Connections, N; High-Pressure Gas Goods, O; Service Boxes, P; Tools, Q; and Miscellaneous Goods, R. These sections are all indexed and readily found at a moment's notice. In addition there is also an alphabetical index by which it is easy to find any separate article.

Throughout the catalogue excellent half-tones illustrate to advantage the goods described, and some beautifully embossed illustrations of various of their specialties introduce the different classes of goods. All the illustrations were specially made for this issue.

Altogether it will readily be admitted by readers of The Plumber and Steamfitter fortunate enough to secure a copy that Catalogue "D" is a complete encyclopedia of everything required in the brass goods line for the water, gas and plumbing trades.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, April 21.—A good improvement has taken place in business this week, and the various lines have started to move most encouragingly. The warmer weather, with the rapid disappearance of the snow, has induced a more active feeling amongst plumbers. Building operations will start soon, and many contracts have already been placed. Jobbing work to many will become of lesser importance now, and with the prospects of regular work for some months, stocks are being replenished in the shops. There is still the same divergence of opinion as to the coming extent of building operations, but one thing seems certain—that there will be plenty of work offering whether it be on large or small erections. Overtime is being made on some residences which are in a belated state for occupation on May 1, while repairing work has picked up a little, owing to landlords putting in improvements for new tenants. House hunting is still going on in the city and suburbs, and the leaning of most people towards new flats is apparent. This has the effect of encouraging the smaller builder, and also helping at the same time the smaller plumber.

Prices generally are firm, and manufacturers and supply houses seem much more hopeful as to good trading prospects than they were. Undoubtedly the lift-up in the last few days has had a lot to do with this better feeling. There is no reason why trade should not go ahead with vigor, especially as plumbers are not so nervous as they were regarding work in the coming months.

Iron Pipe—Fair business is being done, and orders have been stimulated by the near approach of open navigation. Prices have been cut on the $\frac{1}{2}$ and $\frac{3}{4}$ pipe, which is now quoted at \$2.03 and \$2.25 for black, and \$2.86 and \$3.08 for galvanized. Foreign competition has brought this about.

Soil Pipe—A distinct improvement has taken place in this line, and orders for immediate and future delivery have been much better, especially in the latter ease. Soil pipe should certainly start to go well now, as building operations will not be long delayed. In fact, the foundations in some cases have already been prepared. Stocks are in good condition. We quote light, 3 to 6 inch, 60 off; medium and heavy, 2 to 6 inch, 70 off; 8 inch, heavy, 40 off.

Lead Pipe—Lead pipe has been stimulated in the last two weeks, and some large sized orders have been placed. Stocks are in fair shape and good business is anticipated. We continue to quote lead pipe and waste at 20 per cent.

Solder—Solder is in better demand. Many shops only stock this line as they want it, but the large contract men and roofers prefer to buy in large quantities. The demand is thus being stimulated with the approach of building. We continue to quote half-and-half 19c, and wining 18c for fair size orders.

Enamelware—Fair business is doing, and some good orders have been placed. Much better trade is anticipated next month, as inquiries seem very favorable. Prices are unchanged.

Brass Goods—Very little improvement in the demand has been noticed. Production still continues to be restricted, but consumers are only buying from

hand to mouth. There is much cheap work on the market at cut prices, but on the well-known lines prices are much about the same. Standard compression work 65 per cent., and fuller work 70 per cent.

Steam Fittings—Steam fittings are still on the slow side. Inquiries are better, and prospects for next month are encouraging. We continue to quote 60 off.

Radiators and Boilers—These lines are showing better strength, but have not commenced to move with the vigor that they will later on when the building season is more advanced.

Metals—The markets have weakened a little, and a reduction has taken place in copper, and lead, while tin is not holding to its price so firmly. We quote: Ingot copper, 14c; ingot tin, \$34; lead \$4; pig iron, \$21.50; for Middlesboro No. 1, \$21.50; Summerlee, \$25.50. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, $2\frac{3}{4}$ c.

TORONTO.

Toronto, April 21.—While prospects for business seem bright there does not seem to be as much doing as the season would warrant. Figuring on jobs appears to be the chief occupation of those looking for contracts—and the figuring is done at decidedly low margins.

"I figured on one heating job last week," said one man last week and merely added ten per cent. over cost of labor and materials. I didn't get the job and found out later that the contract had been let for less than my cost figures." And there aren't any keener buyers in town than this man, either.

Another man who does a large contract business told of losing a number of jobs by from \$100 to \$200 though he had figured on the closest possible margins. This man has a reputation for high-class work and he said the only way the successful tenderers could come out even, let alone making a profit, would be by scamping the work and substituting second grade fixtures and material for the higher quality articles specified. In fact, this man made the statement that this is being done to-day on the bulk of the work being done in Toronto. "Things are about as bad as they could be," he said.

Prices generally are unchanged but some reductions are reported in iron and soil pipe fittings. Some slight changes have also taken place on brass goods.

Iron Pipe—Orders are light and stocks plentiful. Prices are unchanged at \$5.28 for one-inch black and \$6.93 for one-inch galvanized. Cast iron fittings are now 65 per cent., the old rate being 60. The discount on malleable fittings continues at 35 per cent.

Soil Pipe—A better demand is developing and prospects are for a brisk trade during May. Light pipe is still quoted at 60 with fittings now at 70 per

cent. Medium and extra heavy pipe and fittings are quoted at 70 per cent.

Lead Pipe—Some good orders are being placed at the low prices prevailing and a good business is looked for throughout the season. We still quote pipe and waste at 20 per cent., with caulking lead at $4\frac{1}{2}$ per cent.

Solder—The demand is considered satisfactory with prices unchanged at 18 cents for wiping and 19 cents for half-and-half.

Brass Goods—Competition is keen but as several manufacturers have closed down their plants, stocks in the jobbers hands are light. Copper is weak, and there does not seem likely to be a change for some time. We are quoting compression work at 65 and fuller work at 70 per cent.

Enamelware—The recent reduction in prices in Standard Ideal ware has left the manufacturers busy with large orders on hand for future shipment. Jobbers are not so busy but report a good enquiry for high-grade goods. Prices continue as before.

Boilers and Radiators—A very satisfactory trade is being done for this season. As building becomes more active increased orders will be placed. Prices are being maintained exceedingly well.

Don't deal with a house unless you are fully convinced it will not take advantage of whatever confidence you may repose in it, as this is one of the necessary requisites for mutually satisfactory business relations.

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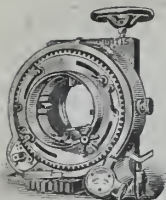
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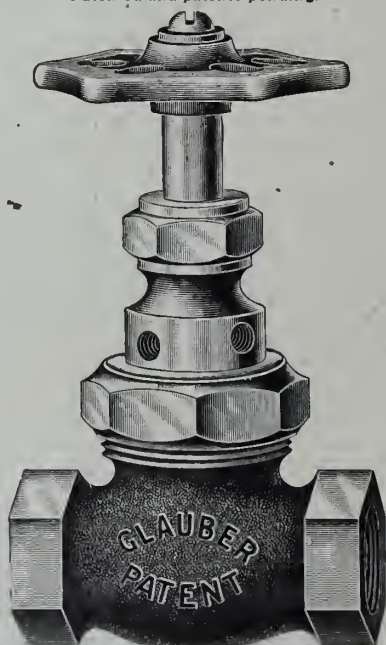
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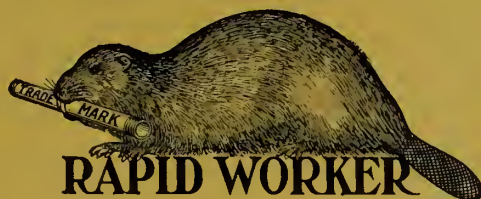
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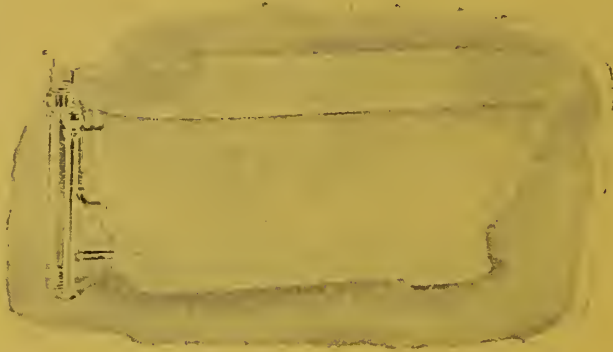
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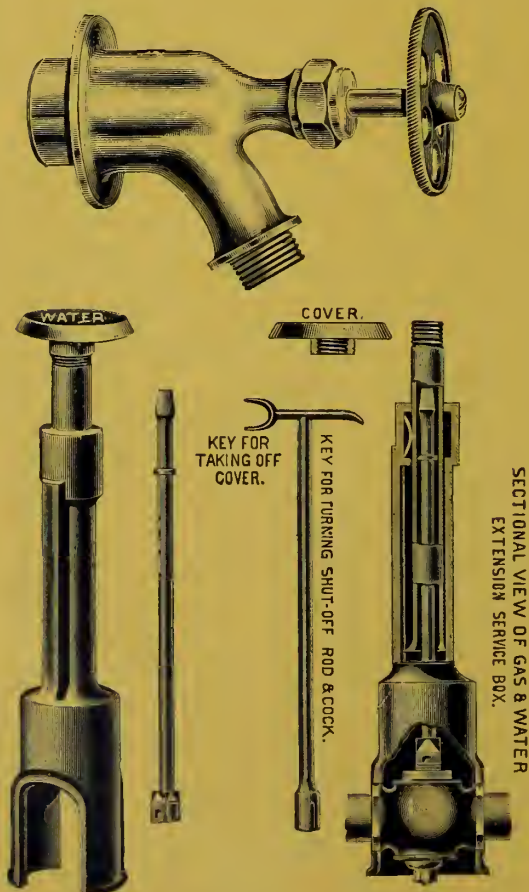
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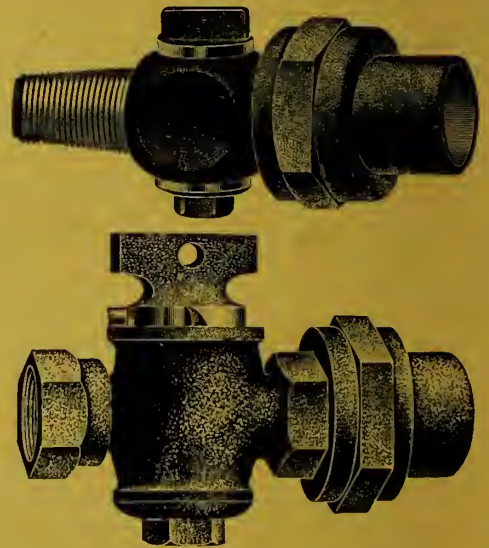
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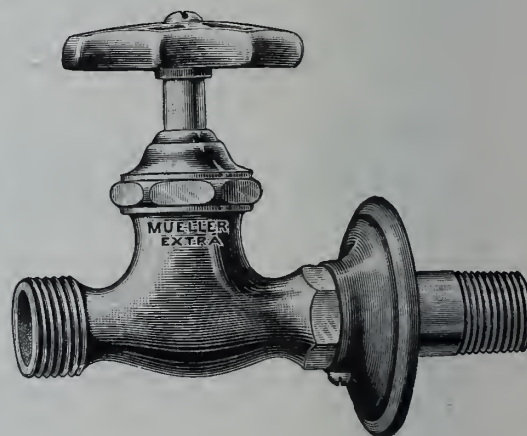
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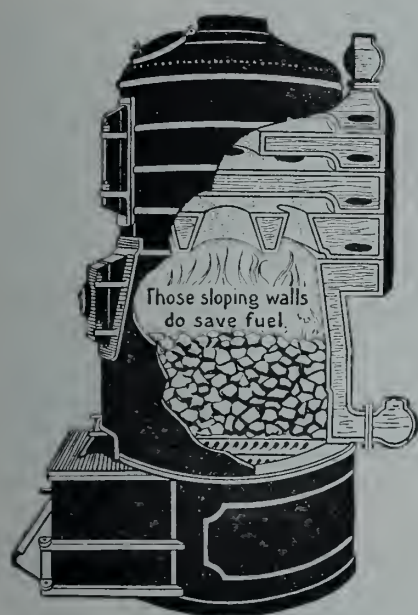
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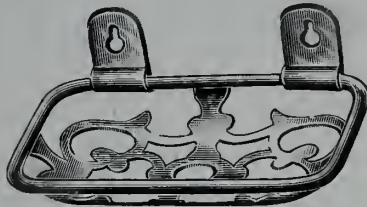
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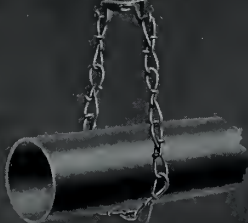
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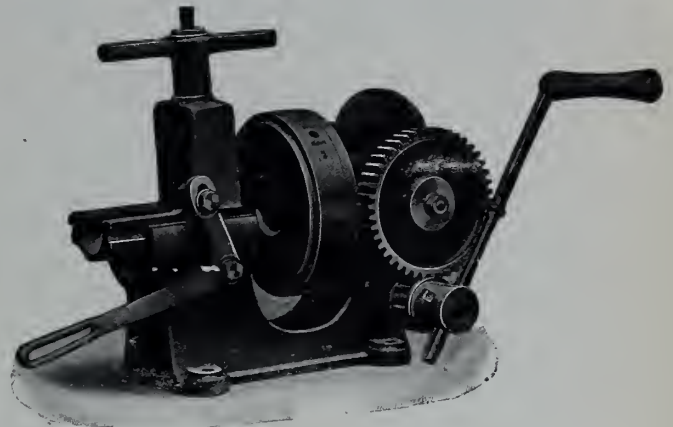
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Boards of Health, Architects, etc.

MONTREAL, TORONTO AND WINNIPEG, MAY 6, 1908

COMING CONVENTIONS.

American Foundrymen's Association, Toronto, June 8 to 12.

National Association Master Plumbers, (also Master Steamfitters' Association), Boston, Mass., June 14 to 18.

American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., July 24 and 25.

Canadian National Master Plumbers' Association, probably at Quebec, about August 1.

tion allow of the next convention being held there during the Tercenary celebration. Due notice of this will be given to the trade in the columns of Plumber and Steamfitter as well as by the secretary to the provincial officers.

H. A. KNOX, Secretary N.A.M.P.

Ottawa, April 25.

OFFICIAL NOTICE.

The Executive Committee of the National Association of Master Plumbers held a meeting in the rooms of the Montreal Master Plumbers' Association, 90 St. James St., on April 23. R. J. McCauley, chairman of the Organization Committee, was unavoidably absent.

A resolution was put and carried that the secretary be instructed to write all the officers, asking them to keep busy in the interests of the association so that when the annual meeting takes place, they may show that they are representative in fact as well as in form. The need of activity was clearly shown as letters were read from the opposite sides of the country from individual men seeking the influence and protection of association. This was inspiring to the executive and should impress the minds of those who are doubtful about an effective legal arrangement ever being adopted permitting prices to be obtained that will admit of the best work being done and leave a fair margin for profit.

It's a good man's mistake to do a bad job once, but that one mistake costs him a whole lot to forget. Another man makes it his policy to prey on the business by skinning the game at all seasons—this character usually flourishes on the side streets or on the limits of the town, and while his patronage is not of the "gilt edge variety" still he is a factor in the way of prices. A few of such men whose expenses are comparatively nil will damage immensely the business of those who pay good wages, pay shop rent and observe all the forms of business. There is work ahead; the executive realize it and they desire every member of the association to help them.

President Watson and Vice-President Laurier will go to Quebec City to see if the rates and hotel accommoda-

EDITORIAL COMMENT.

The predominating question before the plumbing trade throughout Canada to-day is that of securing modern plumbing regulations and a thorough inspection to prevent incompetent and cheap john plumbers from doing contracts in a manner that will bring discredit upon the trade and endanger the health and lives of innocent citizens.

The articles in the last two issues of The Plumber and Steamfitter have provoked widespread interest and dozens of letters have been received congratulating the paper on the stand it has taken. Good plumbing regulations and work are necessary alike in the best interests of the trade and the community at large, and the Plumber and Steamfitter seeks the co-operation of all health officers, sanitary inspectors and master plumbers in its effort to make conditions favorable to good plumbing work being done and unfavorable to scamped jobs on which material and workmanship are not of the highest order.

* * *

On another page the Mayor of Toronto supplies a report made to him by the Medical Health Officer, in which that official claims that the work of his inspectors is confined by law to certain limitations. That being so and it not being denied by Dr. Sheard that the health of the community is endangered by the present obsolete regulations, we hope to see the doctor, in his dual capacity as head of both the city and provincial Boards of Health, take the lead in a movement to bring Toronto's sanitary regulations up-to-date. And who but the Medical Health Officer should undertake this work? The public pay him to protect them from unsanitary conditions and the heads of the city and provincial governments look to him for advice. His recommendations could hardly be disregarded, whereas the recommendations of well intentioned master plumbers would probably

be unheeded, and on an opposing word from the Health Officer would be thrown out altogether.

It certainly is up to Dr. Sheard to give his closest attention to the subject of revising Toronto's plumbing regulations and after seeing that the most modern ideas are incorporated, that the inspection of work done is most thorough. The work of the head of the Health Department is undoubtedly heavy, but the following facts are too important to fail to receive prompt attention:

1. A master plumber was caught doing unlawful work and being taken into police court was let go without a fine. The plumbing inspection department, on being asked for particulars by this paper, declined to give any information, saying, (a) that such cases were common, and (b) it was not in the interests of the city that publicity be given the fact that poor plumbing work was done in Toronto.

2. The Plumber and Steamfitter commented on the incident and asked some practical questions, which are yet unanswered. Readers of The Plumber and Steamfitter took up the discussion and charged that Toronto's plumbing regulations were out-of-date, that the inspection of work done is inadequate, and that the sanitary conditions of many buildings, particularly in the downtown districts, are dangerous to the public health.

3. The registration of master plumbers (not controlled by the Health Department, but certainly subject to its recommendation) is altogether too easy and encourages poor work. Men who cannot hold jobs as journeymen can take out licenses (no examination being necessary) and undertake new jobs and patch up old plumbing systems, their registration being taken by the public as an assurance of their capability to do satisfactory work. And anyone, drain digger or blacksmith, can, by paying a \$1 license fee, accept a contract to do plumbing work for some friend who wants some scamped work, and after the job is done, go back to digging drains or shoeing horses.

* * *

The Toronto Globe, Hamilton Spectator and London Advertiser have, during the past fortnight, commented upon articles published in the last issue of Plumber and Steamfitter. Practical work will be done by master plumbers who encourage their local papers to discuss subjects relating to sanitation. By showing the community that he is interested in encouraging the best possible sanitary conditions, in preventing disease rather than curing it, the plumber will be regarded as an honored citizen rather than as a highway robber, as is too often the case.

* * *

The Globe's editorial (April 27) reads as follows:

The current issue of Plumber and Steamfitter severely criticizes the practical working of the system of plumbing inspection in Toronto. It is asserted that the staff of the inspection department has not been increased in proportion to the growing needs of the city, and that it is consequently easy in some cases to evade the requirements of the law. With many demands for inspectors it is sometimes impossible to secure an inspector for several days, and a contractor unwilling to wait may cover up the work to be inspected. It is said that with the present staff of inspectors it is comparatively easy for unscrupulous property-owners to secure the construction of unsanitary plumbing by failing to report alterations, and by employing men willing to risk the possible consequences of violations of the law.

With the complaints about the ease with which men can secure registration as master plumbers

there will be very little sympathy. Such registration cannot be made too easy. The public do not approve of the current aldermanic tendency toward surrounding every trade and business with restraints that force the price of household necessities up to combine levels. It is not necessary for a master plumber to be able to wipe a joint or bend composition pipe. So long as he employs men who do work according to the most exacting specifications the public have no interest in or right to meddle with his knowledge or capacity. The public should see that all work is properly done, but any supervision further than this can tend only to the creation of costly monopolies. Let us have careful and perfect inspection of plumbing, but let us leave the plumber alone except when he violates the law. Any registration further than is necessary to the detection and punishment of offenders merely tends to promote monopoly. If the present clerical and inspection staff is not equal to the expanding needs of the city all necessary increases should be made. Negligence must not be allowed to develop, for with the growth of the city the danger from this source must proportionately increase.

With the argument that the registration of plumbers cannot be made too easy we have already partially dealt. The Globe would have anybody with \$1 to pay the license fee, a master plumber, relying upon inspectors to protect the public. Would the Globe have anybody with a dollar bill a doctor or a druggist and rely upon detectives to see that the experienced workmen hired by ignorant employers do good work? That is the argument they use. It is purely anarchistic and in a community that believes in government cannot be considered for a moment. Until men become angels it will be necessary to adopt regulations governing the various departments of labor, and particularly those dealing with the health and life of the citizens.

The Globe's editorial brings one fact out clearly—plumbers and steamfitters must rely upon their own paper to state their case and protect their interests. The Globe, in arguing for cheap work, regardless of other interests, is taking the same position other daily papers will take. It is popular to hold the plumber up to ridicule as a robber. The public likes it and the space writer caters to the public demand. Papers, therefore, which are endeavoring to elevate the plumbing trade, should receive the hearty support of all in the trade.

* * *

A suggestion made by a correspondent on another page is that the plumbing regulations in force in the important cities in the United States and Europe be published in The Plumber and Steamfitter and by comparison with the Toronto regulations an endeavor be made to learn the most suitable by-laws for use in Canadian cities. This suggestion will be adopted. Already The Plumber and Steamfitter has received letters and plumbing codes from nearly a score of the most important cities over the border and beginning with the next issue a series of articles will be published dealing with the important points combined in the regulations adopted and with the weak points in the by-laws in force in Toronto, Montreal, Ottawa and other Canadian cities.

We expect to begin with Washington and follow up with St. Louis, Cleveland, Pittsburg and other cities known to be in the lead in the adoption of progressive ideas. Again we invite readers of the paper to take part in the discussion by forwarding their views for publication. Let The Plumber and Steamfitter be an open forum and the trade will benefit immeasurably.

Plumbing Conditions in Canada

Toronto's Medical Health Officer Says Inspector's Hands Are Tied—Montreal Plumbers Tell of Conditions in that City
Correspondents From Various Cities Condemn Conditions Which Encourage Poor Work and Discredit the Trade

PLUMBING CONDITIONS IN MONTREAL.

The recent case in Toronto of a plumber being charged with putting a dummy vent to a kitchen sink, and the articles referring to it in Plumber and Steamfitter, have caused widespread interest in Montreal. It is realized that only by an active crusade of this description, by thrashing the matter of offending plumbing work and ineffective inspection in public organs can the reform of certain abuses which exist in the plumbing industry be brought about. It is a reform which has many difficulties in its way, and will so long as certain conditions obtain which encourage unlawful work and render detection far from easy. As apparently is the case in Toronto, it cannot be said that unlawful work is not performed in Montreal by men, who if they know they are doing wrong, carry out the job under pressure of circumstances which are hard to resist.

The general opinion of plumbers in Montreal seems to be that so far as the by-laws are concerned not much fault can be found with them. It is in the reading of the law that the fault lies. The inspection is not thorough enough, neither is it possible with the present system for it to be anything else. More inspectors and better qualified men are needed. However, in the first place, with regard to the responsibility of the plumber who evades the law, we find—after going into the question very thoroughly with various authorities—that proprietors of a certain class are very much to blame for the plumbers' misdeeds. Oblivious to the health of their tenants, and to the general health of the city, they are only anxious to cut down expenses, and if the large plumber will not do the job at the impossible price offered, then it is tendered to the small man with the direct encouragement and probable instruction to put in the shoddy work.

As an instance of the lengths to which some men will go, we were told of a case where a permit was taken out by a well-known plumber to make some alterations in a house. The price for the work seemed to be too much for the landlord, and he asked the plumber to hold over the work for a while. To the astonishment of the plumber some time afterwards he was warned by the Sani-

tary Department that certain work of his carried out under the permit had been condemned. As he knew nothing about the work he was naturally much surprised, and on investigation it was found that the proprietor had used the permit, and secured a man who knew little or nothing of plumbing to carry out the work at nighttime, and as cheaply as possible. It is in this way that bad plumbing is encouraged, and the strict obedience to the law by responsible plumbers nullified.

Plumbers should make a stand against those proprietors who offer work at prices that both sides know cannot be accepted without evading the law. There is no doubt that if a strong example was made of those men caught inciting plumbers to do unlawful work—for after all it is a criminal offence—much good would be done. The punishment for plumbers who break the law, and know that they are breaking the law, should be stronger than it is. Plumbers must have a license to practice—and there should be no hesitation in taking that license away.

Then, as regards the inspection question. There should be more inspectors, so that the minimum amount of chance should exist of unlawful plumbing. The position should be a lucrative one, so that good men should be attracted. An inspectorship is a responsible position, and should only be filled by a responsible man. He should be a trained man, as put forward by the city engineer in an interview below.

A system of education, with a strong legal corrective behind it if necessary, is needed to do away with the abuses that exist to-day. The proprietor who encourages, and directly incites the plumber to do unlawful work should be educated to the fact that he cannot with impunity do such things. The plumber should be made to realize the grave danger to the health of the city by such work, and the bad odium he brings on his trade and his fellow plumbers by not making a stand against those who would force him to do cheap and unlawful work, and should refrain from undercutting his competitor, and tendering at prices that cannot carry a profit. The tenant too, should be educated to the fact that it is in his interests that he should pay strict attention to the plumbing of any house that he intends to occupy and to see that everything is as

up to date as it is possible to get it. The city should likewise realize its responsibility to the citizens generally, and make its inspection department thorough and efficient. A policy of cheese-paring, so far as wages are concerned, is fatal to progress. Plumbers should work together, and report any attempt to put in unlawful work to the authorities, and see that the authorities moved in the matter.

The whole question is a difficult one, but by active co-operation between the Health Department and the plumbers themselves, and the stopping of the price-cutting that is going on, many of the evils that exist to-day could be altered, and the whole plumbing industry lifted up a great step in progress.

Montreal By-laws Not Enforced.

Peter C. Ogilvie, chairman of the Sanitary Committee of the Montreal Master Plumbers' Association, interviewed on the subject of plumbing work in the city, said that the Montreal by-laws, as they read, were as nearly perfect as they could be, but the trouble was that they were not enforced rigorously enough. If plumbers who evaded the law were deprived of their license, say, on a second offence, and not allowed to practice it would do a great deal to prevent illegal plumbing work, such as that recently made public in Toronto. While the plumber, who does illegal work is largely to blame, he is not wholly responsible, for certain pressure is brought to bear upon him by the proprietors for whom he does the work. It can be seen what a temptation there is for a man when the landlord says, as they often do, that unless the plumber does the work cheaply the job will go to somebody else. It is not right that such pressure should be put upon a man, who may be hard pressed for a job at the time. If proprietors who were found inciting plumbers to put in illegal work were made strong examples of, much good would be done.

"With regard to inspection," said Mr. Ogilvie, "I think there should be more inspectors, and better qualified men. Why, how can you expect to get good inspection when some of the officials we have had have been barbers, tailors and gardeners, although I will say that some of them have turned out efficient men so far as their acquired knowledge could make them. But the

whole principle is wrong. Inspectors should be steady, reliable and trained men. A practical plumber with a course in the hygiene department at McGill, for which the city should pay, would make the best inspector. They should be independent of the civic authorities so far as appointment is concerned, so that they should be freed from any wire-pulling as regards their report and need not fear dismissal for taking any action they think necessary in the health of the city. The department of plumbing inspection should be taken out of the city hands and made a Government organization."

Boston and Montreal Compared.

J. E. Dore, official sanitary engineer for the City of Montreal, interviewed by Plumber and Steamfitter, said that the Montreal plumbing by-laws were certainly better than those of any other city of which he knew. In his opinion they could not be improved upon, but unfortunately they were not enforced to the letter because the staff of inspectors was not strong enough, and the people were not educated to such a degree of refinement in plumbing as to expect, and demand only the best and most perfect plumbing in their houses.

"Of course," said Mr. Dore, in reply to a question as to whether practices similar to that recently made public in Toronto were known in Montreal, "I cannot say that unlawful acts of this description do not go on unknown to the authorities, but if the perpetrators get found out they are severely dealt with. There must be co-operation from the builders and everybody concerned if the laws are to be carried out to their full extent.

"The plumbing by-laws of Montreal," continued Mr. Dore, "are about perfect, but we want a stronger force of inspectors, and highly trained men at that. It is impossible to get the best work from men who receive only a low salary, and who are not educated to the work. An inspectorship should be made a highly qualified position with an adequate salary so that educated men should be tempted to fit themselves for the position. Boston, say with a half-million people, has 23 inspectors, well-paid men of good education and technical training, who not only attend to the plumbing, but to the drainage, gas pipe, electric work, etc., were, in fact, construction inspectors. Montreal, with a population of 400,000, has only seven plumbing inspectors. This was most inadequate for such a large city."

In reply to a question as to how he would advise an improvement of the situation Mr. Dore said that he would like an institution similar to the English Sanitary Institute, where men

could be trained for the responsible post of inspectors, where they could go through a theoretical and practical course. McGill University gave a course of sanitary inspection, but it was not a regular one. With such an institution as the English one, with proper classes and masters, a highly qualified set of men could be turned out. But inspectors should be highly paid men, which was only fair considering the important duties depending upon them. Given a good standing, the right class of men would be attracted, whereas now the post was only a poor one, and therefore, the good men could not be secured. "The by-laws are all right," concluded Mr. Dore, "what we want is higher inspection and that can only be obtained by offering better inducement to the right class of men."

Unlawful Work Done.

Richard Egan, interrogated on the point of the existence of unlawful plumbing in Montreal, said that such work was undoubtedly done in the city. He knew of a case, for instance, where instead of a back vent leading out to the air, the pipe only led to the inside of the wall and was then capped. The inspection was not thorough enough, or many of the abuses would be found out and stopped. Very careful inspection was needed to discover some of the unlawful work that was put in.

Referring to the dummy vent charge in Toronto, Mr. Egan said he was not in favor of the back venting system. Back venting was not necessary. This came in when the pipe from the sink was reduced in size causing the water in the trap to be syphoned out releasing the sewer gas. To overcome this, back venting became necessary. When he served his apprenticeship there was no back venting. Only a large pipe was used, and after an experience of over thirty years he still considered the old system the better one. At the present time a 4-inch pipe was used for a series of closets and a back vent was necessary in each case. Previously a 4-inch pipe was used for one floor, 5-inch for two and 6-inch for three, etc., and a back vent was not necessary. He did not believe in back venting, and undoubtedly it had given opportunity to do such acts as recently made public in Toronto.

ARE INSPECTORS' HANDS TIED?

Editor Plumber and Steamfitter: Sir,—In further reply to your communication of the 25th, covering copy of Plumber and Steamfitter, of the 22nd instant, in which are contained certain articles respecting 'obsolete plumbing,' I beg to say that I am in receipt of a

report from the Medical Health Officer (to whom your letter and paper were transmitted) from which I extract the following for your information:

"I desire to say that whilst I freely admit that in some minor details improvement could be made in connection with our present plumbing by-laws, they are in their entirety as good as those in force in any city upon this continent.

"'Percussion' jumps to the conclusion that the Official Health Department is omnipotent unrestricted by any law, and therefore responsible for everything. He also, judging from his communication, entertains the opinion that the municipality can make and enforce all manner of laws relating to health matters and sanitary plumbing. I would respectfully point out to 'Percussion' that the powers of the Health Officer, Health Department and municipality, on health matters, are definitely and distinctly limited by the Public Health Act, Chap. 248, R.S.O., of which the plumbing by-law constitutes a part, and is embodied therein as Schedule 'B' of said Act, so that in order to make any such sweeping changes suggested by 'Percussion,' we would require to secure authority from the Ontario Legislature, and might experience more difficulty in securing the same than in preparing a communication for the Plumber and Steamfitter.

"'Percussion' points out in his communication, 'If by accident the plumber is discovered, of what use is it to fine or jail him?' 'Why not use a little common sense, and fine the man who has made the money?' 'Percussion' forgets that this is the very essence of British law and justice, which punishes the man who perpetrates a crime. He further goes on to point out that 'everything in connection with the plumbing department and license system is so easy and foolish that any man or child owning \$1 and a quantity of nerve can become a master plumber in five minutes.' He evidently does not know that the Health Department have no more to do with the licensing of plumbers than 'Percussion' himself. As to the question asked 'Have they (the Health Department) no power to compel factory owners to provide sanitary accommodation?' I would again refer him to the Ontario Factories Act, with its special section relating to Health of Employees and Sanitation of Factories, and the enforcement of which is entirely under the Department of Agriculture, of the Ontario Government.

"As to employing the same number of inspectors as we employed fifteen years ago, I would point out that then we had three plumbing inspectors, now we have six plumbing inspectors, and

one drain inspector, who devote their entire time to such work.

"Did the time permit, I could point out other things in the letter of 'Percussion' which illustrate his great lack of information as to plumbing and sanitary laws."

JOSEPH OLIVER, Mayor.

Toronto, April 29.

PRACTICAL QUESTIONS ASKED.

Editor Plumber and Steamfitter. Sir,—In your issue of April 22 appears a letter from "Percussion," who evidently knows what he is talking about.

He hits the nail squarely on the head when he practically says it is not the plumber nor the inspector that is to blame for existing conditions, but that antiquated and inadequate by-laws are in force. It's the system and not the individual that is at fault. But who is the real sufferer under just such conditions? No one, but every one of us, the public at large. The general health condition is endangered in every way.

But, who approves of the present condition? Surely not the plumber, the inspector, the owner, the builder, the architect, or any one else who has come in contact with the question.

Who would say that back vents are of any use at all where the soil pipe is of ample size, according to the number of fixtures attached to any one stack—that back vents are likely to be of no use a comparatively short time after they are put in use, and that local vents are really operative under all conditions and at all times?

Is a water test that puts the greatest strain on the horizontal drain really any test for the stack of soil pipe near the first or second floor?

Would it be safe to leave out the main trap or house trap, and practically vent the sewer through the soil pipe, when we know of the loose joints from settling and other causes?

Should tile pipe ever be allowed to be placed inside a building, even if it is covered over?

Should a closet or urinal ever be allowed in an inside room that has no connection with the outside through a skylight in the ceiling, or a window?

Should not all reconstruction work come under the same supervision as absolutely new work?

Should any plumbing alterations be permitted that are not subjected to inspection?

Should plumbing be done by plumbers or by shoemakers?

Are not now syphon traps without back vents safe and sanitary?

Is there really any danger of syphoning or back pressure when 4-inch soil pipe is used in the average private house with only one or two closets?

Should not any by-law recognize the distinction between medicine, hygiene and sanitation, yet knowing their correlation, as sanitation in its broadest sense deals purely with the equipment and construction?

Should not the by-laws provide for the inspection and registration of the number and character of fixtures at periods after the same have been placed in service?

Should not the by-laws be so formed that they perforce ensure the greatest safety at all times to the general public?

Toronto, May 4.

"VENTS."

STRATFORD'S SANITARY INSPECTOR'S VIEWS.

Editor Plumber and Steamfitter: Sir,—In your issue of April 8 appeared an article entitled "Good Plumbing Inspection Needed," with a quotation from an evening paper as follows:

"Charged with putting a dummy vent in a house at — St. George Street, which is contrary to law, — was summoned to court. According to the Medical Health Department, the vent for odors from all sinks must go to the big soil pipe," etc.

The whole article appears to be so vital, as it were, to the plumbing business, that I very reluctantly wish to say a few words, reluctantly, because, when a plumbing inspector from a small place like Stratford would criticize anything it would be cast up to him that when he gets more experience he will know better.

The above quotation is somewhat misleading, as it implies that the vent is placed there for the purpose of conveying away the odors arising from the use of the sink, which is certainly not the case.

The vent pipe of any fixture, except a water closet, is not to allow the odors to escape, but to supply the trap to which it is affixed, with a sufficient quantity of air, to prevent the water in the said trap from being syphoned out, and allowing the air in the soil pipe to escape into the room through the trap.

This brings us to the question of the kind of trap it is necessary to use. Eight out of ten city by-laws, require all traps to be vented, regardless of position, size or make, and in the case of a four or six flat tenement, the venting system alone, costs as much as the balance of the system complete, leaving out the fixtures themselves. And any one wishing to put in one extra sink, where such by-laws are in force, will find that the expense of installing a vent to the same and complying with the rules, will be double the price of the fixture and connection to stack combined, when the use of a non-syphon trap

would reduce the cost to a minimum and still be absolutely safe.

At the annual meeting of the Plumbing Inspectors in Chicago last February, I discussed this question of vents and non-syphon traps with several prominent inspectors, and found none who said non-syphon traps were not safe, but they said could not use them as their by-laws would not admit of it and when I asked "Why not change the by-law?" the answer given was "You come and try it."

You ask, "What conditions were responsible for such work?" My answer is, city by-laws that are out of date, and have not kept pace with the manufacture of sanitary appliances.

Poor inspection from whatever cause, and last, but not least, to quote your article, "The full knowledge and consent of the owner in order to save a few paltry dollars," this is the greatest nuisance I have to contend with.

Very much more could be said, as you ask some very pointed questions, but I will only add that I have no trouble with the plumbers here. Tab is kept on every job, and all must figure on the same quality of material, plan and method of installation.

R. H. MYERS,

Sanitary Inspector.

Stratford, April 29.

DOMINION LEGISLATION SUGGESTED.

Editor Plumber and Steamfitter: Sir,—I consider Plumber and Steamfitter the best trade journal we have in the country, it being up-to-date in every respect. I have always found the subjects treated both interesting and profitable.

I am heartily in accord with your views as regards a most rigid plumbing inspection. The handy man and cheap johns would then be compelled to step down and out. Unsanitary work would not then be tolerated. It is simply astonishing to note the number of so-called plumbing jobs done all over the country to-day. They are anything but sanitary, I can assure you.

If possible, we should have Dominion legislation on the subject. The public would then have the benefit of high-class plumbing work, which would be very beneficial to the general health of the citizens of our country.

A. R. K. MACDONALD.

Elora, Ont., May 1.

BE PAINSTAKING.

The mere fact that so much of a plumber's work is out of sight should make him doubly careful in seeing that even the smallest "repair job" is perfectly finished. Distrust of a plumber means dismissal from further consideration by a customer.

Somerville's New Brass Plant

Modern Ideas Adopted in New \$200,000 Works—Many Special Features, Including Splendid Conveniences for Employees
—An Important Addition to a 30-year-old Business.

The new brass plant of Somerville Limited, Toronto, is representative of the best modern factory construction and equipment. A brass plant, when there are so many separate departments, is a difficult plant to design so as to have the whole plant a unit, and yet have each department separate as it should be. Yet in this plant this has been accomplished with remarkable success. The features for inter-department communication are excellent, and shipping facilities very convenient. The lighting is splendid, even to the low ceiling basement. The use of wire partitions where feasible, for instance, between the machine shop and tool room, between the machine shop and pattern shop, and between the foundry and the core-room, facilitates good lighting. Glass is used where a more effective partition than wire is required, as between the plating room and the shipping room, and between the plating room and the polishing and buffing room.

The plant consists of the main building, 60x175 feet, with a wing 30x50 feet, and a foundry 50x100 feet. The main building is of slow-burning mill construction, but the foundry is of steel construction. Limestone brick is used throughout. Between these main departments are fire doors and wire glass partitions. The main building is two

storeys in height at present, but the roof construction is such as to allow jacking up for the addition of another storey when necessary. Thus ample pro-

vision is made for upward extension in the main building and the foundry can be extended at the rear end.

On the first floor of the main building

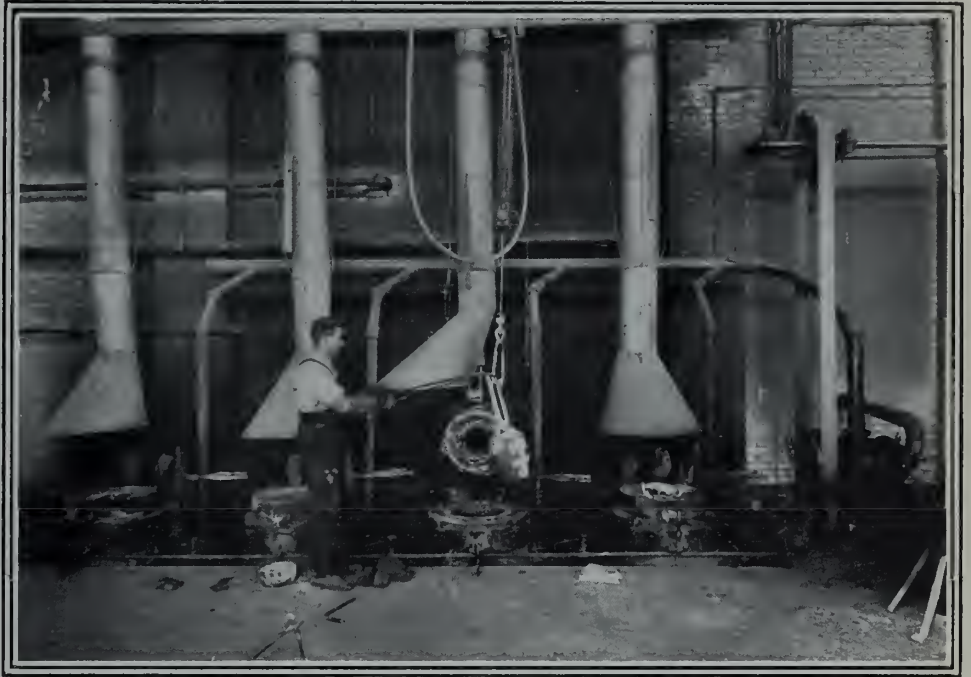


Fig. 2.—View Showing Oil Furnaces, Which are of the Most Up-to-date Pattern. The Crucible is being taken from the Furnace by Automatic Compressed Air Crane.



Fig. 1.—Foundry 50x100 feet. It is a Brick and Steel Structure. The Floor is 4 in. of Concrete, with 1 inch of Sand and Vitrified Brick on Edge.

the office, shipping room and polishing and buffing room are located. In the second storey are the machine shop, the tool room, the pattern shop and the superintendent's office. In the basement are situated the closet tank department and the convenience for the employees, which constitute a feature in themselves which will be discussed later.

Heating and Ventilation.

The heating, ventilating, and artificial lighting are along the most up-to-date and efficient lines. The plant is heated most effectively with the exhaust steam from the engine. The heating is on the plenum system, air being taken from outside, drawn through steam pipes, through which is passed the exhaust steam, and discharged by the 72-inch fan into galvanized pipes running to all parts of the plant. The steam coils are arranged in sections in order that the heat may be regulated without altering the volume of air. In summer the exhaust steam is cut off and the fan used for ventilating purposes only. The sys-

tem is most efficient, giving a complete change of air every three minutes.

All electric wiring throughout the plant is enclosed in iron conduits, which

also much cleaner, and have here been found much more economical.

This company make all their own patterns and mount them, using both metal

is found to do good work. Other foundry equipment includes Hannah Engineering Co.'s pneumatic shakers and squeezer, Sprue cutter and Todd tumbling barrel. The floor of the foundry consists of four inches of concrete, with one inch of sand and vitrified brick on edge.

At the south end of the foundry is the core room, partitioned off from the foundry by wire screens. The demand for cores in a brass foundry, making plumbers' supplies is very large, and this accounts for the large and well-equipped core room.

Machine Shop and Tool Room.

The castings go from the foundry to the machine shop, by means of an electric hoist operated by induction motor. This elevator has a fireproof shaft, and was installed by the Otis-Fenson Elevator Co. Convenient to the elevator is situated the machine shop store room, which is partitioned off from the machine shop by wire screen. This room is equipped with a Fairbanks multiple computing scale, by which the small castings are counted by weighing, that is, one of the castings is placed in one of the pans, and in the other the same castings are put until the two pans balance. A certain weight rate exists between these two pans, and thus the castings are counted. The accuracy of this method of computing depends, of course, upon whether each casting weighs the same.

The machine shop or brass finishing room, as it is called, is equipped with

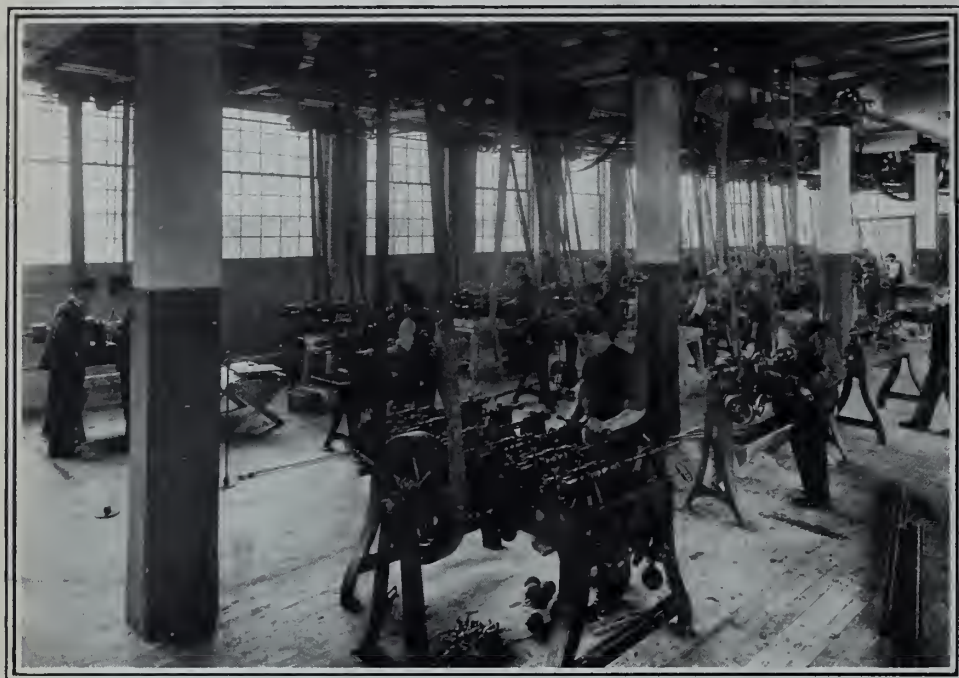


Fig. 3—Well Lighted Brass Finishing Department.

together with the other fireproof features, allow a very low insurance rate.

A Modern Brass Foundry.

The correct way to see a plant is to follow the raw material through the various processes to the finished material. The railway siding runs right into the centre of the plant, convenient to the shipping room, the store room, the foundry and the power plant. The manufacture, however, really starts in the foundry. Fig. 1 is a general view of the foundry, showing the molding floor in the foreground, and the oil furnaces in the background. The stock room, for raw metals, is also shown in the far end of the foundry, which is kept locked. The door shown opens to the receiving platform on the railway siding. Fig. 2 gives a close view of the four crude oil furnaces made by the Fisher Crucible Furnace Co. The illustration shows the crucible being removed from one of the furnaces by pneumatic hoist. The crude oil is stored in an 8,000-gallon tank in the yard. To the right of the illustration can be seen a Dodge & Stacey blower for the furnaces. The hoods over the furnaces to remove the fumes were installed by W. E. Dillon Co., Ltd., Toronto, as were also the hot blast conduits in the heating system, and the exhaust conduits in polishing and buffing room.

With these oil furnaces seven or eight heats per day can be taken, whereas with coke furnaces only three or four heats are possible. Oil furnaces are

and wood patterns. The pattern room is partitioned off from the machine shop by wire netting. For storing patterns, the plant is equipped with a large pattern vault, 20x12 feet, and also a smaller one. These vaults are, of course, absolutely fireproof.



Fig. 4—Polishing Room, Showing Ventilating and Dust Removing Apparatus.

The molding floor is equipped with a Tabor molding machine, which is being thoroughly tested out, and more machines will be installed later if this one

a complete line of Warner & Swasey brass finishing lathes, which are shown in Fig. 3. In the foreground of this illustration is seen a six-tap grinding

machine for grinding seats of cocks. This machine was built by the Milwaukee Grinding Machine Co. Other equipment of the brass finishing room includes a Warner & Swasey double-head keyway machine, and a valve milling machine for milling the hexagon part of valves, built by the American Tool & Machine Co.

All the tools used in the plant are made in the tool room and this necessitates a well-equipped tool room. The equipment includes a Vearney & Trecher universal milling machine, two Flather tool room lathes, a Flather shaper, a Lodge & Davis Machine Tool Co's drill, a J. Stevens Co. universal grinder, hack saw, etc.

Polishing and Plating Room.

The polishing room shown in Fig. 4 is a thoroughly up-to-date and efficient one. In fact, so efficient is the exhaust system for removing dust from the machines, and the system of ventilating, that the air is quite as fresh and clean as in any part of the building. That is something to say about a brass polishing room. In the illustration the exhaust heads at each polishing and buffing machine can be seen. All these small pipes lead to the main exhaust pipe in the basement. The air from this main pipe exhausts into a cyclone receiver outside the building, in which a good deal of metal is recovered.

The plating room is shown in Fig. 5. It is equipped with a 14-foot tank, and thus is capable of plating work of great-

stock room for tubing and the shipping room.

Superintendent's and General Offices.

A distinct feature of this plant is the superintendent's office, situated on the

side to the shipping and receiving platforms. Carrying out the same idea, the main office has a glass partition to the warehouse, and thus from the office a view is had of practically all the lower floor. From the two offices the entire



Fig. 6—Lining Closet Tanks Fitted With New Patent Ball Cock with Revolving Disc.

second floor of the main building, and having glass on three sides. On one side the superintendent can command a full view of the machine shop, tool

plant can be watched, with the exception of the engine and boiler room.

Engine and Boiler Room.

The engine room is equipped with a 200 h.p. Corliss low-speed Robb-Armstrong engine, direct connected to a 175 k.w. 600-volt, Allis-Chalmers-Bullock alternator. The line shafting in the various departments is operated by Allis-Chalmers-Bullock 500-volt induction motors. The lighting is done with arc and incandescent lights on the three-wire system, current from the alternator being transformed to 110 and 220 for that purpose. The switchboard consists of two panels, one for power and the other for the lighting. The engine room also contains a motor-driven Canadian Rand compressor, supplying the air used in the foundry and elsewhere.

The boiler room is equipped with two Robb boilers, and a feed water heater. A feature of the engine room is that the end of the room opposite the front of the boilers is open to the outside air, the opening being closed with a corrugated iron door, raised or lowered with chain and sprocket wheel. This makes the boiler room very pleasant in summer.

Welfare of Employees.

There are very few plants in which the welfare of the employees has been given so much attention as in this factory. Their health and convenience have



Fig. 5—Plating Room, With Vats 14 Feet Long.

er length than most plating rooms. The plating dynamo was supplied by Hanson & Vanwinkle. On the same floor as these two departments is the warehouse,

room and the pattern room, and from the other side he can see everything going on in the foundry and core room. The third glass side affords a view out-

been provided for on every hand. In the matter of heating, ventilating and lighting, the plant is ideal. Pure, fresh air and good light are necessary to the best working efficiency. The illustrations on the front cover show what has been provided in the way of wash room, shower baths, etc. Every care has been taken to make the wash room strictly sanitary. It contains solid porcelain wash basins and enameled range closets and urinals. Drinking fountains and urinals are also provided in other parts of the plant. Hot and cold water are available at all hours of the day for the showers. As seen in the illustration, the showers have not been completed; partitions between the showers having still to be put up. The locker room contains a locker for each employee. Whether these features for the welfare of the employees will be taken advantage of to a full extent has not been tested as yet. The plumbing work was done by Robert Ross & Co., and the heating by Fred. Armstrong, Toronto.

Figure 6 shows the closet tank department, where tanks are lined with copper, with a special double-lock seam

reinforced with solder. A newly patented ball cock with revolving disc is then fitted into the tank. The manufacture of this is controlled solely by Somervilles Limited. Other supplies manufactured include lead pipe, bends, etc.

The land, building and equipment cost approximately \$200,000, and it is probably one of the finest brass plants on the continent. In addition to this large brass plant, of which F. L. Hazeldine is superintendent, the company maintains large warehouses and offices on Richmond and Lombard Streets, Toronto, of which Fred. Somerville, general manager of the company, has charge.

The company was originally established in 1878 as the Ontario Lead & Wire Company, the plumbing department being established in 1896. Ten years later the company's name was changed to Somerville, Limited, and during the past couple of years Mr. Somerville has been devoting his energies to put into realization his dream of a thoroughly modern brass plant. This he has now accomplished and alongside of it he has helped to erect the splendid plant of the King Radiator Company, of which he is also vice-president.

and if we impress them with the fact that the inspector occupies his position exclusively for their protection, it will be found that these difficulties will be more or less effectively overcome, and the knowledge they have obtained conveyed to others.

It is not to be assumed that the process of educating the masses is to be accomplished at once; in fact, it is a question if it can ever be entirely successful, for while we have with us always the ignorant, and by reason of that ignorance, skepticism and carelessness, it is nevertheless true there are many, aye very many, who are glad to receive the information, so that much is gained by the well directed efforts of a bureau if such a policy is carried into effect.

Secure Confidence of Public.

Assuming that an inspector is fully qualified to perform the duties of his office and that he is fully cognizant of the trust confided to his care, his personality enters largely into a successful administration. It is important to secure the confidence of the public, which is of incalculable benefit in assisting him in the discharge of his duties. This can only be secured by a courteous demeanor and the realization that a "public office is a public trust;" it should ever be borne in mind that the inspector is the servant of the people notwithstanding he is invested with authority by law. It has been said, "a public official is objectionable at all times, and can make himself more objectionable than is necessary." These are true words, for in this country, at least, where every man is a sovereign and is accorded inalienable rights and privileges as a citizen, there is a natural feeling that anything that in any wise savors of restriction is offensive and oppressive. This is an idea that becomes part of the duty of the administration to dispel.

While it is a recognized fact that we must have law, and that it must be the duty of someone to enforce the law for the benefit of the whole community, yet it can be done in a manner that will give no offence, but on the contrary, be received as a public benefit. It is proverbial that the people, as a whole, are law-abiding, and it is no great difficulty, where they understand the motive for legal enactment, to secure that co-operation and confidence that are so essential to success.

Again, it must be remembered there are just as honest men engaged in the plumbing trade as in any other business, that they desire honest work and honest competition, that many of them stand ready to render such assistance as they can for the success of the plumbing bureau. In fact, justice compels the statement that some of the laws that were enacted on this subject were brought about largely by the better element of the plumbers themselves in order that a uniformity in construction and inspection of plumbing might be a legal requirement.

In the exercise of those duties prescribed by law the greatest discretion should be used that they be wisely and justly performed. There may be an honest difference of opinion connected with the work, and while firmness may be necessary, a courteous explanation will probably convince the person of his er-

Administration of a Plumbing Bureau

Paper Read by Winifield S. Reed, Philadelphia, at the Recent Convention of the American Society of Plumbing Inspectors and Sanitary Engineers.

In taking up this subject for discussion it is necessary to consider for a moment the purpose for which a plumbing bureau is organized. Its existence, perhaps, is necessary only as a health measure, and in consequence is a valuable adjunct to a health department, as there is no question of doubt that many nuisances, prejudicial to health, emanate directly from defective plumbing. It is obvious that its primary object is the protection of the public from disease and possibly death; in that respect its importance is second to nothing else. Of what avail is prosperity and wealth if the foundation of life is destroyed by disease, or the enjoyment of life curtailed by its ravages?

The active administration of a plumbing bureau must consider the details that go to make it a success or failure. "Eternal vigilance" must be the watchword of the administration; no detail may be assumed to be carried out until actual visual inspection has been made. The omission of a plug that was intended to close an aperture will make all the difference between success and failure in the most elaborately designed equipment. A careless inspector is worse than none, because the public would in some measure inspect its own equipment were it not taught to rely on the thoroughness of official inspection. While the majority of workmen desire to perform their work in the best manner, others are tempted by cupidity to slight important details in the interest of cheapness. The administration soon learns who are the latter, and must ex-

ercise, if possible, a greater vigilance in inspecting their work.

The Bureau as an Educator.

The successful administration of a plumbing bureau depends somewhat on the culture and intelligence of the inhabitants of the districts; where ignorance of the laws of sanitation prevails, evasion of legal requirements will occur, plumbing will be smuggled in without inspection and in gross violation of all sanitary principles, regardless of the vigilance of the officials. It is only possible to approximate perfection; those who expect to attain it will be disappointed. In this respect it should be, so far as possible, a part of the duty of the administration to educate such persons in the necessity for proper plumbing and pointing out the dangers resulting from defective work. The question naturally arises as to how this may be accomplished.

It is probably unnecessary to specify to a body of gentlemen (so many of whom occupy official positions) the many ways this knowledge may be disseminated, for our experience, no doubt, in this connection, is identical; yet in the department coming under my observation, I have found that in a number of ways (too numerous to mention at this time) information comes to us of places where violations have taken place. If we embrace the opportunity thus afforded to enlighten occupants of houses wherein violations of regulations occur, that such work is a menace to the health of themselves and families,

ror, and at the same time engender a greater respect for the bureau.

A quotation that particularly appeals to me is that "Sacrifice is the Price of Attainment," no great object has ever been, or ever will be, attained without sacrifice. You gentlemen are sacrificing your time and means in attending the annual meeting of this society, many of you are giving your best thought and much of your time during the interval of meetings solely in the cause of humanity; surely, then, it is not great hardship for the inspector to sacrifice, if need be, his personal feelings on occasions in the interest of a successful administration.

Plans Should Be Submitted.

Before the execution of a system of drainage, plans should be submitted to the bureau of plumbing showing the details of proposed construction, together with specifications describing it. This practice should be observed in all cases. It has been found advantageous in alterations and additions to old systems to have the existing portions of the work shown in red lines, and the new portion in black lines, thus showing at a glance the part of the system that is affected. After careful examination by the inspector, if they are found to meet with all requirements they should be given official approval and permission granted for proceeding with installation. By this method the plumber knows just what is required of him, and there is rarely an excuse for a deviation from the plans and specifications as approved. If, however, occasion arise from some unforeseen cause for a change in plan, it would simply require submitting a revised plan. After the completion of the work it should be officially endorsed by

the inspector, showing that the work had been executed in accordance with the plan and specifications, it then becomes a valuable record for future reference.

The keeping of records is an important feature. It is not my purpose either to recommend or describe any particular method, suffice it to say, irrespective of method, that the importance of being able to expeditiously take up a record of any piece of work that has been installed since the organization of the bureau, is so evident that it requires no special mention. I will simply add that all plans which are a part of the records of the Plumbing Division of the Bureau of Health in the city of Philadelphia have been kept on record since the organization of the division, (June, 1886), and the record of any work installed since that time may readily be obtained.

It is also important to keep a complete record of each person engaged in the plumbing business. Registration or licensing of plumbers annually has the effect of keeping the administration in closer relation with the trade, in addition to a correct record of those continuously engaged in the business. If it is considered that plumbers go out of business or leave the city without advising the officials of the fact, it is apparent that records are incorrect if licenses are granted for an indefinite period.

This subject is broad in its scope; there are many things that may be said in connection with it, but I have no wish to occupy valuable time in further discussion of the matter. If I have advanced a word or thought that may prove of value, I shall feel fully rewarded for the effort.

he was exposed by being forced to frequent saloons by his necessity to use their toilets.

Police Commissioner Andrews of New York city reported in 1895 that "the want of public lavatories in the city of New York is a source of very great injury to the efficiency of the police department. Officers are compelled to leave their posts of duty and invariably prolong their absence to an undue extent. Furthermore, whenever they are reported for absence from post, the almost invariable excuse is that of necessity, caused by an absence of lavatories. The excuse, although hackneyed and many times false, is a difficult one to disprove."

Existing Comfort Stations.

Frederick L. Ford, city engineer, of Hartford, Conn., reported to the City Club that New York has 13 public toilet stations, costing about \$25,000 each, built on ground owned by the city, maintained at \$4,000 to \$6,000 expense a year, open at all necessary hours, with both male and female attendants. Boston has a \$16,000 station, providing hot and cold water, with soap and towel, for one cent each. Cleveland combines a trolley waiting room and public comfort station, built by the park department at \$10,000 cost, which registered the visits of 1,485,620 men and 306,780 women in a single year. Smaller cities—Columbus, Denver, Hartford, Indianapolis, Louisville—are already provided with such conveniences or are about to put them in. Abroad the provision is universal in both little and big cities, poor and rich towns. Paris is best equipped. Berlin and other German cities are well provided. Even impoverished Italian towns at least meet the wants of nature. Rio Janeiro has 30 public lavatories in 15 small market places. London gathers enough receipts from paying patrons to meet the working expenses of the free toilets.

To promote the movement in Chicago some of the strongest organizations and clubs in Chicago have combined in the United Association's Committee of the City of Chicago on Public Comfort Stations. Its secretary, Jno. K. Allen, 49 North Jefferson street, can furnish the information and literature available. He wants the names of organizations and citizens who will back the movement.

Public Comfort Stations for Cities

Prof. Graham Taylor Presents Some Strong Arguments in Condemnation of American Cities for Failing to Provide Public Conveniences.

An imperative public necessity is now left to be provided for at private expense. The numerous large office buildings are obliged not only to furnish toilet facilities for their thousands of occupants, but to accommodate a public patronage so large as to inconvenience their own tenants and increase the cost of their elevator and janitor service. Some of their elevator starters say that if they could keep the public from using their toilet rooms they would be able to reduce their elevator service one-third.

Department stores provide most of the toilets which are accessible to women. When it was proposed in the Chicago Federation of Labor to ask the department stores to close on Labor Day, the request was not made because of the objection by one of the members that "if they were closed his wife and daughters would have nowhere to go to use a toilet, and the same would be the case with thousands of other women and children who came to see the parade." The railroad station toilets have an enormous patronage and are used at certain hours far more by the general public than by railroad passengers.

Hotels and restaurants make generous provision for far more people than their

patrons. But in self-defence some of them keep bouncers, forcibly to eject such persons as are deemed undesirable among the multitudes who seek their accommodations. An elevator starter says that he "allows any man to use the toilet facilities in his building if he is respectable looking, but if he is dirty and looks like a tramp he sends him to the saloon across the street."

Saloon Toilets Now a Necessity.

The saloons are left to furnish the only facilities open to the great majority of men and some women all over town. To leave the saloons to meet a natural necessity forces the drink habit upon people, imperils the moral welfare of the community and impregnably trenches the liquor traffic. The attempt to close the saloons on Sunday in New York city raised the natural outcry against shutting the people out of the only toilet accommodations open to them. A Chicago pastor, the men's club of whose mission is among the organizations trying to secure public comfort stations, says that a member of the club, who was formerly a teamster, pleaded that other men should be relieved of the temptation to drink to which

NEW TRADE ARRANGEMENT.

American Radiator Co., Chicago, has made an arrangement, dating from March 23, 1908, by which it becomes exclusive sales agent and distributor of the air valves manufactured by the Norwall Manufacturing Co. The Norwall Manufacturing Co. has sold its packless valve to the Detroit Lubricator Co., which will manufacture them hereafter. Geo. D. Hoffman, of the Norwall Manufacturing Co. will hereafter make his headquarters at the general offices of the American Radiator Co., and will devote much of his time assisting the American Radiator Company in the sale of the Norwall specialties.

Builders' Show at Montreal

Attractive Displays Made by Manufacturers of Heating Apparatus, Roofing Material and Builders' Supplies—Illustrations of Some of the Exhibits.

The second annual show held under the auspices of the Montreal Builders' Exchange at the Coliseum, Montreal, in Easter week, proved most successful, and was in consequence extended four days longer. The various booths were effectively arranged, and with the strong co-operation of the exhibitors, most excellent results were attained. Nothing that builders and contractors required were lacking in the display, and the most modern methods of heating and

King & Co., King Radiator Co., Clinton Fireproofing Co., Pedlar Roofing Co., Swan, Church & Co., Montreal Terra Cotta Co., Laprairie Brick Co., Francis Hyde & Co., Hyde & Webster, T. A. Morrison, Frank Ramsey, Window Strip Co., Geo. W. Reed, Alex. McArthur & Co., Gurney, Massey & Co., Sovereign Lime Co., Montreal Wood & Mosaic Flooring Co., Decarie & Lesage Co., G. P. Brown, Geo. A. Goodfellow, Dominion Radiator Co., Brantford Roofing Co.,

themselves the fine workmanship and up-to-date qualities of the goods.

The "1908" Daisy Boiler came in for a great share of attention. This boiler has earned for itself a gratifying reputation in the past quarter of a century for durability, general economy of coal, and heating capabilities, and the new features which the 1908 Daisy now possesses, greatly add to its qualities, and make it even a better boiler than it was before. The popular and



Daisy and Viking Boilers, King Radiators, Bath Heaters and Soil Pipe, Shown by Warden King, Limited.

cooking were displayed and explained to the vast crowds that daily visited the show.

Plumbers were especially interested; for here they saw all the latest ideas that the most progressive firms of Canada are putting on the market, and the cuts and details that we give below show the extent of the field covered and the interesting, not to say, artistic, appearance of the exhibits.

The list of exhibitors included Lockerby & McComb, Canadian Asbestos Co., Hill Electric Switch Co., Martel, Stewart & Co., E. F. Dartnell, Warden,

Armstrong Cork Co., Robt. Mitchell & Co. and Seaman, Kent & Co.

Warden, King & Co.

The display of Warden, King & Co., 151 Craig Street west, Montreal, at the Builders' Show was generally commended. Arranged near the main entrance, the position was one which well set off the popular articles that the firm place upon the market. From large to small boilers, from the new King radiator to the smallest fitting, there was a complete assortment to interest the many observers, who could see for

reliable "Viking" boiler was also greatly in evidence.

Great interest, too, was centred in the King radiators, which are being manufactured at the large new King radiator plant at Toronto. The radiator line is a new one for Warden, King & Co., but they are leaving no stone unturned to manufacture an article that will be as equally serviceable in its way as the Viking and Daisy are in theirs. All that modern ideas can contribute to the science of radiation has been utilized in the manufacture of these radiators, and the result is a most artistic and ser-

viceable article which received general approval from the plumbers and contractors visiting the show.

All the newest accessories in the trade were on view, and the whole display gave a good idea of the fine work turned out by the firm, as well as the wide range of plumbing and heating goods manufactured.

At the show L. M. Giasson looked after the sales end for the French-speaking department, and W. Rodden and A. W. Lamontagne for other departments, the whole being under the superintendence of L. A. Payette, the Montreal manager for Warden, King & Co., R. J. Cluff, of Cluff Bros., selling agents for Warden, King & Co., at Toronto being also present during a large portion of the show.

The Armstrong Cork Co.

Much interest was taken by all visitors in the display of the Armstrong Cork Co., whose Canadian office is at 425 Coristine Building, Montreal, and is under the capable management of W. G. Kent. The booth at the show was artistically laid out with cork board as flooring and steps, also counters, while disposed all about the stand were speci-

ing houses, refrigerators and for ammonia, brine, ice and cold water pipes.

Mr. Kent has greatly expanded the

tured in four thicknesses to meet different service conditions and to secure satisfactory results, the proper



Exhibit of Lockerby & McComb, Manufacturers of Building Paper, Montreal.

business since he took charge and his capable staff at the show did good work in making the goods better known to the trade. Cork has such manifold

grade must be used and the material carefully applied. No pains were spared to point out all the details to the actual and possible customers of the company. Attractive booklets and other information will be sent on application.

Lockerby & McComb.

Lockerby & McComb, of 65 Shannon St., Montreal, whose Shield Brand ready-roofing has acquired a wide reputation among the builders of the country, not only for quality of material but for its reasonable price as well, had a nicely arranged booth in a prominent location at the Builders' Exhibition. Miniature roofs covered with this high-class roofing, attracted the attention of spectators who could see for themselves the adaptability of the material, its unequalled quality and its durable finish. Roofing to be of any value to the user must be very, very good, and an inspection of these roofs under the courteous guidance of those in attendance at the booth, showed that here was value and more than value for the money, and what Lockerby & McComb claimed for their roofing was fully justified on inspection.

Francis Hyde & Co.

Much attention was drawn to the booth of Francis Hyde & Co., who were in evidence in strong form, the general opinion being that, without any disparagement, their exhibit was one of the finest displays of contractors' and builders' supplies ever seen in Montreal. The interior of the booth was fitted up to represent a modern dwelling, an original feature of which was the tile floor, constructed of imported Welsh



Cork Board and Pipe Covering Shown by the Armstrong Cork Co.

mens of cork board, illustrating its insulation uses, also for pipe covering for cold storage buildings, breweries, pack-

uses that it was really an education for many to hear them explained.

Nonpareil pipe covering is manufac-

quarries of a dark red color, made very effective by a joint of black mortar. Sewer pipes ingeniously fitted together with junctions formed a unique and ornamental fence around the booth.

The display of samples of the various bricks, which this firm handles, was one which fully substantiated their claim to be leaders in this line. They are the Canadian representatives of the Harbison-Walker Refractories Co., the largest fire brick manufacturers in the world, and special attention was asked to their building brick, which can be supplied in 35 different shades and which is rapidly gaining favor with the Can-

adian architects and builders for high-class buildings, where both looks and quality are a factor.

industry was called to the several samples submitted by the Canadian Art Stone Co., Limited, of Toronto, represented by Hyde & Co. These samples were made by a new process, which indicated a marked progress over their previous product, which heretofore was considered one of the best, if not the best, on the market.

Lafarge non-staining cement, which has been used so successfully in the construction of art stone, was also exhibited, and attention was called to the fact that this is the only non-staining cement on the market.

Potted flowers and palms placed here

was not absolutely fireproof, and the exhibit comprised roofing, siding, flooring, lathing, studding, furring and other accessories that go into the modern building.

Their Oshawa steel shingle, which has been a staple article with the trade for this past twenty years; their Pedlar perfect expanded metal lathing, and their elaborate line of metallic ceiling and wall plates created an impression among those who visited the exhibition.

As will be seen in the photograph, special prominence was given to the Pedlar method of interior construction embracing reinforcement for stone and



Francis Hyde & Co.'s Exhibit at the Montreal Builders' Show.

adian architects and builders for high-class buildings, where both looks and quality are a factor.

In addition to their regular line of wheelbarrows, Hyde & Co. have recently taken over the agency for a special line, manufactured by the Lansing Wheelbarrow Co. and each of these barrows is specially adapted for the particular use for which it is intended. These bid fair to become popular among the contractors on large works, many of whom have already recognized their labor-saving qualities.

The attention of those interested in art stone and the development of this

and there throughout the booth lent a decorative appearance to the whole, and the manager and his efficient staff, who, so courteously welcomed visitors and supplied all information requested are to be congratulated on having made their exhibit one of the chief features of the show.

Pedlars' Roofing.

The exhibit of the Pedlar People at the Builders', Contractors' and Hardware Show was certainly unique and as an eminent engineer remarked, was most instructive to those interested. There was not a particle shown that

cinder concrete floors, roofs, walls and partitions. This firm also exhibited a new fabric which they have been testing for the past four years, called The Pedlar Truss Fabric, designed for the purpose of applying plaster, cement, stucco and roughcast to the exterior of structures, and the tenacity of these compositions to flat surfaces through the medium of this truss fabric was marvelous to a degree.

Heretofore, architects and builders have been desirous of using more cement on the exterior of cottages and suburban residences, but have been loath to attempt it from the fact that our Canadian

climate was very destructive where wooden lathing was used. The Pedlar People have gotten over this difficulty and now offer to the trade this fabric which, when applied to the building and covered with mortar or cement, assures a permanency that has not heretofore been possible. This truss fabric is highly recommended and it is predicted that its sale will be enormous.

Another unique product displayed were their Pedlar and universal corner beads, which are applied on all outside angles after the lathing is affixed and before same is plastered. These corner beads offer the greatest resistance against fracture at the angles and will certainly be a boon to all builders. 56,000 feet of these corner beads were used in Sir William MacDonald's Agri-

it to the Canadian people at a price that was attractive and that insured its use.

Commencing in a humble way and commanded by a gentleman of remarkable perseverance, energy and grit, who surrounded himself with clever associates and experienced mechanics; the success of this remarkable firm is not to be wondered at and the result of it all is that the name of Pedlar is to-day known in every part of the British Empire; they having established warehouses in Montreal, Ottawa, Ont.; Toronto, Ont.; Winnipeg, Man.; Calgary, Alta.; St. John, N.B.; Halifax, N.S.; London, Eng.; Auckland, N.Z.; Sydney, Australia; Cape Town, South Africa; Kobe and Tokyo, Japan.

economy, and in general usefulness of form. That the firm has attained their object can be seen from the great popularity of their goods, and the great hold that these household necessities have secured on the womenfolk of the country.

At the Builders' Show, Gurney-Massey Co. showed a most complete assortment of heating and cooking appliances and admiration was general over the merits of the articles. The fine booth of the company was one of the centres of attraction and the boilers and ranges were carefully inspected. The Oxford Hot Meal Gas Range, the only kind with a modern arrangement of burners and which is an ornament to any kitchen, was greatly admired. The housewife knows the advantage of hav-



Elaborate Display Made by the Pedlar People at the Montreal Builders' Show.

cultural College at Ste. Anne de Bellevue, 47,000 feet were used in the Linton Apartments and they were also used in every important structure erected in Montreal during the past twelve months.

To those who have had business relations with the Pedlar People during the past sixteen years and who have watched the onward and upward march of this firm during that time, their success must appear as marvelous, but as nothing succeeds like success, the reason of theirs is that they have endeavored to keep themselves ahead of the times and if anything was presented to them that had merit they were willing to take the chance and offer

Gurney-Massey Co.

The heating and cooking appliances of the Gurney-Massey Co., 387 St. Paul St., Montreal, have justly acquired a household reputation for durability, economy of gas and coal, excellent workmanship, and last, but not least, reasonableness of cost. It has not been an easy matter to secure such a pitch of perfection. But the Gurney-Massey Co. have spared no effort to put on the market articles on which they could pin their reputation. Expense has been a minor consideration in manufacturing a stove, range or boiler, as the case may be, that displays the latest ideas in fuel

ing a range that can be easily cleaned. The Oxford Double Oven Gem, a first-class range at a startling low price and which has as much capacity as any high-priced range, and the Oxford boiler, which is said to be unequalled for its fuel economy and for its unique arrangement, whereby the greatest amount of heat is given off with the least amount of coal, commanded equal attention.

Edmonton's building permits for the first ten days of April totalled \$125,000. Since the first of the year contracts calling for the expenditure of \$1,482,350 have been let, as compared with about \$700,000 for the first three months of 1907.

BUSINESS OPPORTUNITIES AND CONTRACTS AWARDED

Building Notes.

Guelph may build a municipal abattoir.

A new fire hall will be erected in Winnipeg.

A \$35,000 post office will be built at Welland.

Welland will build a new \$20,000 public school.

A \$12,000 school will be built at Craik, Sask.

A new post office is to be built at Duncan, B.C.

A \$12,000 fire hall will be erected at Indian Head.

A \$20,000 post office will be built in Quebec East.

H. P. Cox, Winnipeg, will build a \$12,000 home.

A \$17,000 registry office will be erected at Ottawa.

Sparta, Ont., will erect a \$5,000 school building.

Moose Jaw, Sask., will erect a \$100,000 high school.

A new school will be erected on Lorne Avenue, London.

A new 20,000 school will be built at Minnedosa, Man.

Regina, Sask., will erect a \$100,000 hospital this year.

The C.N.R. will erect a \$50,000 station at Brandon.

E. D. Gooderham, Toronto, will erect a \$20,000 residence.

A \$50,000 Carnegie library will be erected at Calgary.

A. Calori, Vancouver, will erect a \$100,000 hotel there.

A \$12,000 town hall is proposed to be built at Ridgetown.

A \$100,000 apartment house will be built in Victoria, B.C.

A new \$16,000 high school building is proposed for Dundas.

St. Thomas Oddfellows may build a hall at an early date.

Woodstock will erect a new \$20,000 public school building.

W. B. E. Smith, Niagara Falls, will build a new hotel there.

The Men's Club, Winnipeg, will soon erect a \$30,000 building.

Paris, Ont., proposes to erect a new \$55,000 central school.

Plans are prepared for a \$14,000 school at Niagara Falls.

Jno Chrichton, Winnipeg, will erect a \$40,000 apartment house.

The Imperial Bank will put up a new building at Welland, Ont.

Plans for an Aged People's Home in Dundas have been prepared.

London masons are contemplating erecting a Masonic Temple.

J. J. Dissette, Vancouver, will build a \$20,000 apartment block.

Wm. Ingram, Fernie, B.C., will erect a \$12,000 business building.

G. A. Ellis, Renfrew, will erect a business block this summer.

A tuberculosis hospital will be erected in Brantford this summer.

W. F. Gardner, Vancouver, will erect a \$100,000 apartment house.

C. J. Brown, Westmount (Montreal) will erect a \$10,000 residence.

A new theatre building will be put up at Port Stanley this summer.

Wepler & Helwig, Hanover, will build a business block this summer.

The I.O.O.F., Hamilton, propose to erect a \$100,000 lodge building.

All Saints Church, Winnipeg, will cost \$125,000. Plans are ready.

A \$25,000 Catholic boarding school will be erected at Fort William.

A \$20,000 barn will be erected on the Brandon, Man., Asylum grounds.

A \$20,000 dwelling will be built for Mrs. C. C. Cummings, Toronto.

James Havey, Ottawa, will erect a \$15,000 block of seven dwellings.

A \$20,000 club building will be put up by St. Thomas railroad men.

A \$12,000 addition will be made to Boyd Street school, Owen Sound.

E. Windebank, Winnipeg, will erect a summer hotel at Winnipeg Beach.

The site for the new Bank of Nova Scotia, Winnipeg, is being cleared.

A \$6,000 Old Folks' Home will be built at Middlechurch (Winnipeg).

The National Finance Co., Vancouver, will erect a three-storey building.

The Orangemen of Parry Sound will build an opera house this summer.

The Children's Hospital, Halifax, are proposing to erect a new building.

Hamiota, Man., will spend \$6,000 on an extension to its school building.

A new school to cost \$50,000 is proposed to be built at Victoria, B.C.

A new opera house is expected to be built in Brantford at an early date.

Winnipeg's old post office will be remodelled and used as customs house.

The Molson warehouse, Montreal, will be reconstructed at a cost of \$40,000.

Ottawa building permits for the week ending April 25, amounted to \$45,500.

Gordon Duncan will build a \$4,200 stone and brick dwelling at Brantford.

W. J. Gillman, New York, will build a new theatre at Portage la Prairie.

H. D. Wright, Vancouver, will build a new hotel which will cost \$50,000.

Plans are being prepared for the new dental college to be built in Toronto.

Tenders are being called for the new Methodist Mission building, Winnipeg.

Winnipeg's building permits for the week ending April 25 totalled \$48,300.

St. James' Presbyterian Church, Hamilton, will build a \$10,000 edifice.

The Imperial Bank will build a branch at Saskatoon, Sask., at an early date.

The Government building at Calgary will be enlarged at a cost of \$21,000.

West Toronto has arranged for the erection of a \$20,000 Carnegie Library.

Work started on the new \$100,000 Sacred Heart Church, Ottawa, on May 1.

The Carter, Halls, Aldinger Company, Winnipeg, have the contract for

the erection of the new jail at Moosomin, Sask.

The National History Society, Montreal, are erecting a new \$80,000 building.

Toronto building permits issued between April 15 and 20 totalled \$140,000.

M. Burger, Canton, N.Y., will build a \$15,000 summer hotel at Morristown, Ont.

H. W. Fisher, Rosthern, Sask., will erect a \$20,000 cement hotel at Hagar, Sask.

A \$25,000 addition will be made to W. L. Tait's apartment house, Vancouver.

Brolley & Martin, Kamloops, have the \$56,000 court house building contract.

A Victoria concern has the contract for the Ladysmith, B.C., \$30,000 post office.

Jones Bros., London, have the contract for the new Hygienic Institute there.

The Canada Life Co., Toronto, will erect four stores on Bay Street, Toronto.

A permit was issued last week for the \$276,000 Winnipeg examining warehouse.

Pembroke, Ont., has accepted Andrew Carnegie's offer of \$12,000 for a new library.

M. C. Sackrider, Medicine Hat, Alta., has the contract for a \$14,000 brick terrace.

The Mahon Block, Victoria, B.C., recently destroyed by fire, will be rebuilt at once.

Winnipeg ratepayers will be asked to provide \$225,000 for new hospital buildings.

Percy S. Peacock, Welland, has the contract for the \$21,000 Welland County Hospital.

Victoria Street Baptist Church, St. John, N.B., will be enlarged at a cost of \$10,000.

Colborne Street Methodist Church, London, propose to spend \$15,000 in improvements.

The Methodist Board of Deacons propose to build a \$125,000 training school in Toronto.

The C.P.R. will erect a \$30,000 building at Kenora, Ont., and present it to the Y.M.C.A.

A \$25,000 building will be erected this summer by Nelson, B.C., Fraternal Order of Eagles.

The Aged Woman's Home, Victoria, B.C., are considering the erection of a new building.

Plans are ready for the new \$20,000 Catholic Church to be erected at Abbotsford, Que.

Jos. Fabion, Verdun, Que., has the contract for the \$50,000 Catholic school to be built there.

Plans have been accepted for the \$80,000 Provincial Normal School, to be built at Vancouver.

The corner stone of the \$30,000 College St. Methodist Church, Toronto, was laid last week.

The new Victoria College library, Toronto, for which plans are ready, will cost \$72,000.

The Canadian Stewart Co., will build a \$300,000 extension to the Chateau Frontenac, Quebec.

K. G. Rea, Ormstown, Que., is architect for a \$10,000 dwelling to be built in that town.

Wesley Methodist congregation, Vancouver, will erect a new \$100,000 church and Sunday school.

Quinlan, & Robertson have the contract for Belleville's new \$45,000 Separate school building.

The Mt. Pleasant (Vancouver, B.C.), Presbyterian Church will build a new edifice to cost \$30,000.

Plans are ready for the \$60,000 building to be erected on the Lighthouse Hotel site, Vancouver.

Plans are prepared for the new Friends' Society College building to go up at Newmarket, Ont.

Oswald Hinds, Manitowaning, Ont., will erect a block of stores and dwellings almost immediately.

Building permits totalling \$526,800 were issued at Fort William the first three months of this year.

W. H. Westman, Chatham, will put up a business block, the upper storey to be devoted to lodge rooms.

Thos. McKenzie, Clinton, has the contract for the new \$13,000 Catholic Church to be built there.

Miles & Williamson, Vancouver, have the contracts (all but heating) for the S. S. Reinhardt building.

Thos. Caron, St. Aubert, Que., has the contract for the new \$11,000 Catholic Church at L'Islet, Que.

The First Presbyterian congregation, Walkerville, will erect a new church, Sunday school and manse.

The Ontario, Manitoba & Western Land Co., Winnipeg, will erect a \$25,500 store and dwelling block.

A \$30,000 science building in connection with Acadia College, Wolfville, N.S., will be erected shortly.

Wm. Hepburn, Vancouver, has the contract for the new Martin & Robertson, six-storey office building.

The G.T.R. will in June expend \$5,000 on alterations and improvements to its Toronto city ticket office.

Moose Jaw, Sask., will have a \$120,000 apartment building. Plans are prepared by Coalman & Cloakley.

The Sisters of Our Lady of the Missions, Brandon, Man., will erect a new convent on their property there.

Foley, Welch & Stewart will erect a huge warehouse, the largest on the Pacific Coast, at Prince Rupert, B.C.

Atkinson & Dill, Vancouver, have the contract for the B. C. Permanent Loan & Savings Co.'s \$20,000 building.

The Dominion Government will erect a \$30,000 public building at Edmonton, and a \$10,500 building at Fernie.

St. Andrew's Church Sunday school, Chatham, Ont., for which plans are being prepared, will cost \$10,000.

The Frontier Amusement Co., St. Louis, will spend \$250,000 on an amusement resort at Niagara Falls, Ont.

Immigration buildings to cost \$3,000 each will be erected at Prince Albert,

Swift Current, North Battleford and Vermilion.

Stratford will build a new school and equip it with steam heating, gravity ventilation, automatic registers, etc.

Both the Methodists and Roman Catholics of Red Deer, Alta., will erect new churches at a cost of \$35,000 each.

Peasey & Batson, Edmonton, have the contract for the \$60,000 school to be built at Norwood (Edmonton) Alta.

Brown & Garson are erecting the new post office at Selkirk, Man., and plans for a new curling rink are being prepared.

Plans have been prepared for the proposed new Provincial Sanitarium for consumptives to be erected at Moose Nose, Man.

Moses & Magdez, Sudbury, will erect a store building with the latest plumbing and heating arrangements. Plans are now ready.

Several hundreds of thousands of dollars will be spent on the asylum buildings at Victoria. A \$60,000 building will go up shortly.

Thos. V. Gearing, Toronto, has the contract for the new wing to be added to Osgoode Hall. The price is \$35,000, not including heating.

Hamilton proposes to spend \$250,000 within the next three years. Eight-room additions will be made to Sophia and Picton Streets schools this year.

Two structures to be built this summer in Winnipeg are J. Y. Reid's \$14,000 home, and S. D. McLennan's \$5,000 residence. Rugh & Riddell have the plans in hand.

An American firm will build a new hotel at Kamsack, Sask., and the Russel and Windsor Hotels there will enlarge, and a number of small stores and houses will also go up.

Excavations have been completed at Fort Osborne, Man., barracks for the terrace of eight houses for the accommodation of the married men and non-commissioned officers.

Permits aggregating \$72,500 have been issued by the Winnipeg city building inspector for the first ten days of April. Of this amount \$20,000 will be spent on ten cottages near the C.N.R. shops.

Excavations have been begun for the erection of a large store and apartment block adjoining the Steel Block, Winnipeg. The owner is T. D. J. Farmer, Hamilton, and the cost will be \$30,000.

Sixty building permits, aggregating an expenditure of over \$450,000, were taken out in Toronto on Tuesday, April 28. This breaks all previous records in applications by 20 permits. Between April 1 and 15, 174 building permits, valued at \$453,000, were granted.

WATER AND SEWAGE SYSTEMS.

Rosthern, Sask., may erect a \$15,000 town hall.

Chilliwack, B.C., will spend \$17,000 on sewer extensions.

Hirsch, Sask., will spend \$75,000 on waterworks extensions.

Ottawa may spend \$5,000 on waterworks extensions this summer.

Toronto will construct a \$15,000 new sewer in the east end.

Indian Head, Sask., will spend \$63,000 on waterworks extensions.

A \$15,000 chemical filtration plant will likely be installed at Stratford.

Lacombe, Alta., citizens are asked to vote \$4,918 to construct a sewer.

Kitsalano, B.C., will in the near future construct a sewerage system.

London's proposed extension to the waterworks system will cost \$560,000.

Medicine Hat, Alta., will spend \$40,000 on extensions to its waterworks mains.

Medicine Hat, Alta., will spend \$25,000 this summer on extensions to its gas plant.

The Montreal waterworks department is asking for \$500,000 for new works during the summer.

Markdale, Ont., ratepayers, will be asked to vote \$20,000 for installing a waterworks system.

London, Ont., ratepayers will vote at an early date on a new water supply system to cost \$560,000.

Tenders are called for the construction of the drainage work at Osnabrock Centre, Ont., estimated to cost \$14,000.

Jno. Rainboth, Aylmer, has been awarded the contract for installing Aylmer's sewerage system, which will cost about \$40,000.

The water commissioners of Brantford are asking for tenders for furnishing and laying of about 2,500 feet of cast iron and sewer conduit pipe.

Palmerston, Ont., has closed contracts for the mains, hydrants, stand-pipe, castings and material for the new waterworks system at a cost of \$23,096.

The Thompson Pipe & Foundry Co., Hamilton, will supply, Chesley, Ont. with iron piping and castings for the waterworks system.

The Stanton Iron Works Co., Nottingham, Eng., have the contract for supplying from 3,000 to 4,000 tons of cast iron water piping to Montreal this summer.

Calgary ratepayers will vote on by-laws asking for \$175,000 to construct and extend the waterworks system, and \$44,000 to construct subways and finish a trunk sewer.

The Montreal city council has decided to purchase from the John McDougall Caledonian Iron Works Company a 12-million gallon Worthington pump to cost \$29,465. According to specifications, the pump must be delivered within nine months.

Preston will advertise at once for tenders to construct sewerage system this summer, council having accepted engineer's report. The system will be divided into two sections, owing to the peculiar situation of the town. A septic tank will receive all sewage matter from the east section before it passes off to the gravel filtration beds. The west sewer will collect all matter in an underground tank and pump it over the height of land, where it will gravitate to the disposal works. The sewer will cross the River Speed to connect with the hotels.

NEWS OF THE TRADE IN CANADA

Hamel & Leduc, plumbers, Magog, Que., have been registered.

Shaw & Mason, Sydney, N.S., are turning out stoves and will now erect a brass foundry.

R. Margison, Victoria, B.C., has taken over the business of the Victoria Plumbing Company.

Blyth & Holloway have a \$1,500 contract to supply the city of Ottawa with lead pipe and pig lead.

The Sachs Heating and Plumbing Co., Berlin, has sold its business to Thompson Winters, late of Owen Sound.

H. W. Munday, of Bleury Street, Montreal, has removed to more commodious premises in the same street.

T. Lessard & Fils., Montreal, have the heating contract for the new school being built at Westmount, (Montreal), Que.

G. A. Wooten, plumber, Halifax, has let his building to the Bank of New Brunswick, which is spending \$10,000 on improvements.

Brule & Gigure, O. Daoust & Co., J. A. Gauthier & Co., and Francois Lepine & Co. are plumbing concerns in Montreal recently registered.

Ogilvie Bros., of Bleury Street, Montreal, have moved into handsome premises which they have erected on the same street.

Wm. G. Harris, Jr., vice-president of the Canada Metal Company, Toronto, was presented on April 29, the eve of his wedding, with a handsome buffet cabinet by the employes of the company.

The Saskatoon Phoenix, of April 22, reproduced the article in The Plumber and Steamfitter of April 8, criticizing the Saskatoon City Council for refusing to raise the license fee charged master plumbers in that city.

F. E. Ellis, representing the Gurney Fdry. Co., Ltd., is fast developing his sportsmanlike talents. In addition to his reputation as a daylight coon hunter, he with Wm. Woods, manager of Gurney's London branch, were two of the judges at the skating carnival of the National Club at London last week.

K. J. Allison, Toronto, has secured the contract for the plumbing work on the new public bath house, laundry and comfort station at St. Patrick's Square, his tender being for \$8,990. Forty showers will be installed and a plunge bath included. George Syne will do the heating work for \$4,450 and W. J. McGuire the wiring for \$500. The figures are abnormally low and there is much discussion in the trade about the job.

Messrs. Gordon and Egan, after working together for 33 years at 120 Mansfield Street, Montreal, have, to their mutual regret, dissolved partnership. Mr. Gordon has been ill for some time, and has in consequence been compelled to give up active work. Owing to building alterations at Mansfield Street, Richard Egan, who is still continuing the business, has removed to 55c Metcalfe Street, lately occupied by A. T. State & Co., plumbers, who have removed to 125 Bishop Street, Montreal.

The Edmonton city council recently called for tenders for the supply of material for making water and sewer con-

nections in the city this year. The tenders were opened this week and the Northern Supply Co., of Winnipeg, were given the contract for the supply of brass goods at \$1,589. Gorman, Clancy & Grindley, of Edmonton, were given the contract for the supply of galvanized iron pipe at \$1,232 and the James Robertson Co., Winnipeg, for lead pipe at \$5.60 per 100 pounds.

Richard Johnson, tinsmith, with the W. E. Dillon Co., Toronto, who had his back broken December 11 last, while working at the King Radiator plant, and who sued his employers for \$5,000, was awarded \$1,500 damages under the workmen's compensation act by Chief Justice Mulock on April 30. His Lordship charged that Edward Neville, the Dillon Company's foreman, was guilty of "gross carelessness" in sending Johnson into a large galvanized pipe, which was only held by one rivet. He also remarked that the defendant company should of their own free will double the amount of the award. Johnson is still in the hospital and will be looked after by the Dillon Company so long as he lives, they announce.

There are big things in prospect for the plumbers of Galt. Some years ago the town spent \$300,000 in constructing an extensive sewerage system, and up to the present very few citizens have taken advantage of it. The Board of Health has now stepped in and will recommend that a certain section of the town, yet to be mapped out, be forced by a by-law of the council to connect with the sewer system. This will mean the abolishment of all outside privies and the installation of up-to-date sanitary conveniences. When it is considered that the portion of the town selected will probably be a fifth of a mile square, the number of services to be installed can be easily judged. The Board of Health decided that such a step was necessary in the interests of the health of the town.

FORBES PATENT DIE STOCK.

All who have had experience in the cutting and threading of wrought iron pipe, especially the larger sizes, know well the difficulty with which it is attended. Either a hand die stock, with its long handles, or a cumbersome, heavy and expensive power machine must be used. In the former case, it is rarely that anything larger than 4-inch pipe is attempted, and even then it requires four men to do the work, and very hard work it is; in the latter case the machine is not portable, and all the pipe has to be carried to and from the machine, and, as they take up so much room and are so very heavy, it is impracticable to use in confined places or in isolated mills.

The Forbes Patent Die Stock, manufactured by the Curtis & Curtis Co., of Bridgeport, Conn., it is claimed, meets the requirements of the case without the above disadvantages. The machine consists of a die-carrying gear supported by a shell and actuated by a small pinion embedded in the side of the shell and working on the large gear, with the pipe vise attached to the back of the machine. To operate it, the pipe is placed through the pipe vise with the end to be threaded against the back of

the dies. The die-carrying gear is then revolved by means of a crank on the end of the pinion and as the dies revolve, the gear is drawn back into the shell and the dies are thus brought on to the pipe. These dies are open and adjustable to any variations of fittings, and, when the thread is cut, they can be opened and the pipe taken out without running back or stopping the machine. In cutting off pipe the gear is shoved back into the shell, and held by a stop, so as to give it a rotary without a traveling motion. A blade cutter is then inserted in the gear, which is automatically fed forward as the gear revolves.

The advantages claimed for this machine are: It is portable and can be carried from place to place and the pipe cut on the spot without the delay and expense of carrying it to the machine. This is very important for mining work thus avoiding carting pipe a long distance to power machines and saving a great deal of time and expense. In case it is desired to thread the end of the pipe without disconnecting it, and where only one end is exposed, the machine can be slipped on and the work done without taking the pipe down. On account of the great leverage obtained by the small gear working on the larger, pipe even as large as 12 inches can be threaded by one man with ease, while on 2-inch and 3-inch pipe, a boy will do the work with only one hand on the crank. Dies can be sharpened by grinding without first drawing the temper, and, when one of the set is lost or broken, a new one can be supplied without replacing the set. The shells are adjustable for wear, which greatly prolongs the life of the machine.

These machines are made in a great variety of sizes, to meet almost any range desired from $\frac{1}{4}$ to 15 inches for hand power. By the addition of a cast iron base, with the necessary gearing and countershafting, they can be fitted to run by power, so that they can be used by power as a power machine in the shop, or taken from the base and used on outside work as a hand machine.

When desired a directly connected engine or dynamo is connected with them, so that they can be run directly from a steam or electric current, without the necessity of having power available.

FOUNDRYMEN'S CONVENTION.

Plans for the exhibit of foundry supplies and equipment at the convention of the American Foundrymen's Association, the Brass Founders' Association, and the Associated Foundry Foremen, at Toronto, June 8 to 12, have been developing steadily. For the first time in history all branches of the iron and brass foundry will be fully represented in operation, including core ovens and cupola and brass melting furnaces.

The programme is as follows:

Monday, June 8—Exhibition and meeting of the Associated Foundry Foremen.

Tuesday Afternoon—Formal opening of the convention and exhibition.

Tuesday Evening—Official reception.

Wednesday—Business session.

Wednesday Evening—Left open.

Thursday—Business session.

Thursday Evening—Moonlight excursion.

Friday Afternoon—Trolley ride.

Friday Evening—Smoker.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, May 5.—Trade has gone ahead these last two weeks, and both the supply houses and the plumbers are more contented with the situation. Building operations have not started with any rush yet, but the foundations are being prepared in many cases, and soil pipe in consequence is moving in better bulk. It is unfortunate, now that prospects are brighter, that there should be trouble between the Bricklayers' Union and the Builders' Exchange, which is composed practically of all the contractors in the city. The latter want a sliding scale adopted, but the union object, with the result that a strike has occurred and building is tied up. The builders say that with more bricklayers in the city than there is employment for, the strike will not last long, but the men on the other hand say that they can tie up building operations indefinitely. In any case, building prospects will not be improved by the trouble, and, therefore, it comes especially hard on plumbers who have been eagerly awaiting building operations after a winter, that so far as work is concerned, has not been one of the best. Building prospects have improved recently, and there is evidence that, leaving out the question of a prolonged tie-up, there will be plenty of work offering. The erection of residential houses in the municipalities around the city will be as active as ever, if not more so, but so far as the large business premises are concerned, the outlook is not so good.

Prices keep firm and with better confidence in the future, plumbers are increasing their stocks. The opening of navigation has made the supply houses more busy, and some good orders are going out by the first boats. The Builders' Show has tended to liven matters up, many taking advantage of the opportunity to see the latest designs in heating and cooking apparatus.

Iron Pipe—Business is looking up, and some good sized orders have been despatched. Inquiries are increasing, and as stocks are on the light side, a steady call for iron pipe should prevail from now on. We continue to quote: $\frac{1}{4}$ and $\frac{3}{8}$ pipe at \$2.03 and \$2.25 for black, and \$2.86 and \$3.08 for galvanized.

Soil Pipe—Soil pipe continues to show improvement, and orders are increasing in numbers and in bulk. Full swing has not been imparted to the line yet, but the business being done, indicates a good season ahead. We quote: Light, 3 to 6 inch, 60 off; medium and heavy, 2 to 6 inch, 70 off; 8 inch, heavy, 40 off.

Lead Pipe—With the other lines, lead pipe is moving more freely. Orders, if somewhat on the light side, are in fair number, and the season is opening out as well as can be expected. We continue to quote lead pipe and waste at 20 per cent.

Solder—Solder is a somewhat irregular commodity as the majority of plumbers buy as they want the article. The

demand is quieter again, but fair quantities are moving out.

Enamelware—Business is not all bad considering conditions. Inquiries indicate that when building operations are in fuller swing, business will be good. Prices are unchanged.

Brass Goods—The demand is still on the weak side. Manufacturers are not turning out to the full extent of their plant by any means. We continue to quote: Standard compression work, 65 per cent., and fuller work, 70 per cent.

Radiators and Boilers—A decided revival has taken place in these lines. Some good orders have been taken, and prospects look more encouraging than they did. Steam fittings are also moving in better strength. Prices are unchanged.

Metals—The metal market has not changed very much. Tin still keeps up remarkably. Iron ore, in consequence of the re-opening of navigation, has dropped in price. We quote: Ingot copper, 14c; ingot tin, \$34; lead, \$4; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 11c; light copper, 10c; heavy lead, $2\frac{3}{4}$ c.

TORONTO.

Toronto, May 5.—An optimistic feeling pervades the trade, and while no very large orders are being handled the number of building permits issued seems to indicate that a good season's business is ahead. The trade is busy at present figuring on plans and specifications and ere long a hum should resound in the air from the workmen's tools. There are still a few jobs begun last Fall to be finished, and the newer factory buildings are having water curtains installed for fire protection. This new feature of recent years provides much work.

Heating lines (boilers and radiators) are moving very well, considering the early time of year, and this may fairly indicate a busy summer and fall. Prices in iron pipe and soil pipe remain unchanged, but some rumors of cutting are afloat. Lead pipe quotations are now 30 instead of 20 per cent. Prices on the other lines remain as before.

Iron Pipe—As reported two weeks ago, orders are light and stocks plentiful. Prices are unchanged although some cutting in the small sizes is noted, and this may tend to lower prices. One-inch black is still quoted at \$5.28, and \$6.93 is still asked for one-inch galvanized. Cast iron fittings are still 65 per cent. The discount on malleable fittings is unchanged—35 per cent.

Soil Pipe—The demand is increasing for this line of goods and the prospects are bright. Light pipe is still quoted at 60, and fittings at 70 per cent. Medium and extra heavy pipe and fittings are quoted at 70 per cent. There is a slight tendency to lower prices, but the indications are not pronounced.

Lead Pipe—The indications for a good season continue and some fair orders are being placed. Pipe and waste are now quoted at 30 per cent., instead of 20, and caulking lead remains at $4\frac{1}{2}$ per cent, although it is said some has been sold as low as $4\frac{1}{4}$ per cent.

Solder—Prices are unchanged at 18

cents for wiping and 19 cents for half and-half. The demand is fair.

Brass Goods—Compression work is still at 65 and fuller work remains at 70 per cent. Business in these goods is fair.

Enamelware—Prices unchanged, trade medium, but many inquiries are received concerning this line of goods.

Boilers and Radiators—Considering the season, a very good business is being done, which is sure to increase as the summer advances. Many of the orders are marked "rush," which causes quite a stir about the shipping rooms. Prices are unchanged and hold out well.

UNITED STATES NEWS.

On May 1 the amended rules and regulations of the Board of Health of Philadelphia, governing house drainage, ventilation and cesspools, came into effect.

The Monarch Brass Company, Cleveland, will soon place on the market a new anti-syphon trap arranged in conformity with the new covering on venting formulated in many cities. This trap will have no mechanical sealing features and no secret apartments.

Twelve new tenement inspectors were recently appointed to the Bureau of Sanitary Inspection of Chicago, to meet the growing needs of that department, the number now being increased to 35. The men were selected from an examination held by the Civil Service Commission.

There has recently been organized at Kalamazoo, Mich., a new company under the name of the Enameled Steel Tank Co., to carry on the manufacture of a new steel closet tank.

Elasko is the name of a new cement for gas, steam, water and air pipes. It is the invention of a practical plumber, who guarantees it to make a tight joint, stay tight, and yet never set. The manufacturers, F. M. Stearns & Co., of Jamestown, N.Y., will send a sample free.

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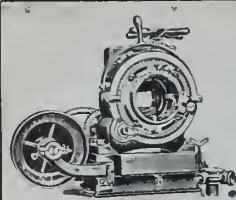
Sanitary—L. Legrow, Toronto.

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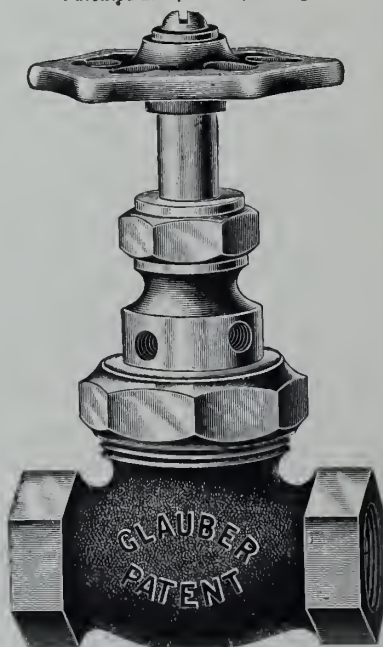
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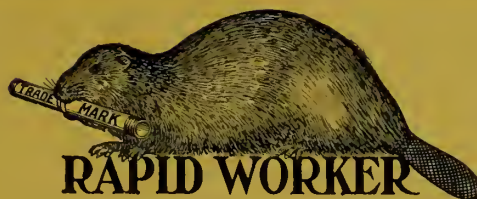
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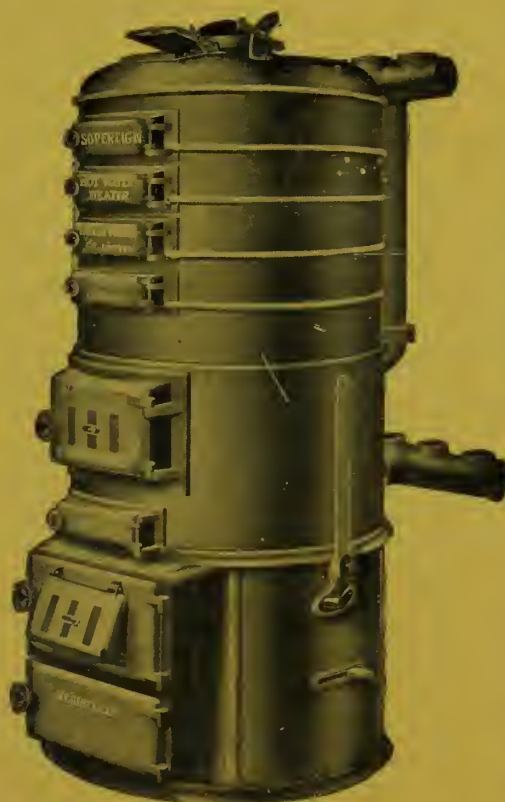
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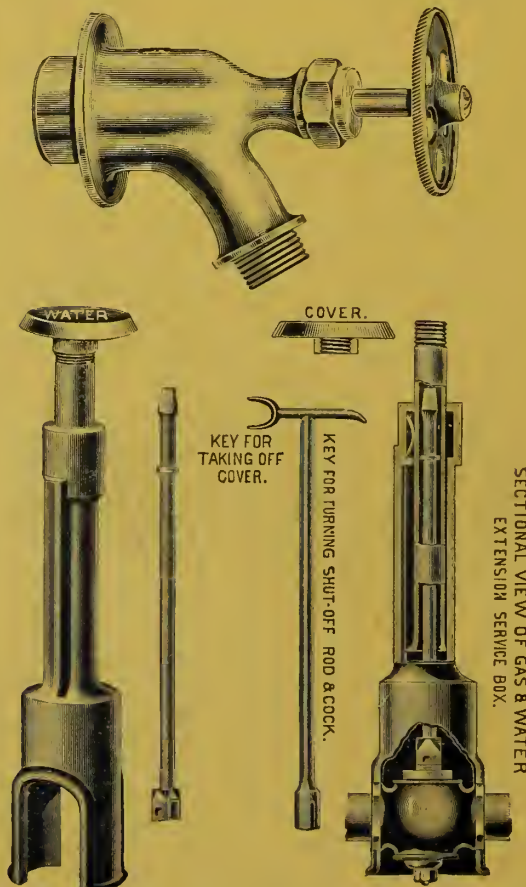
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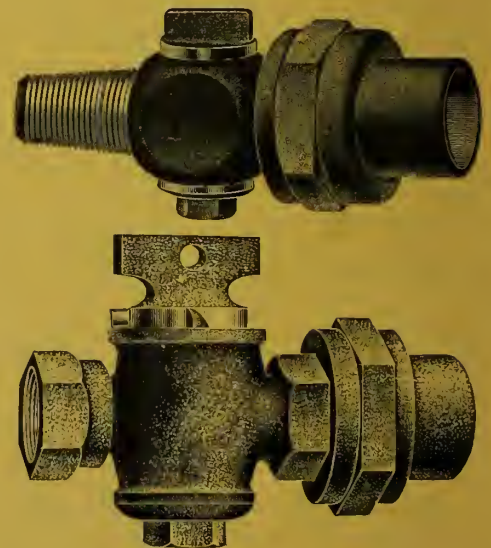
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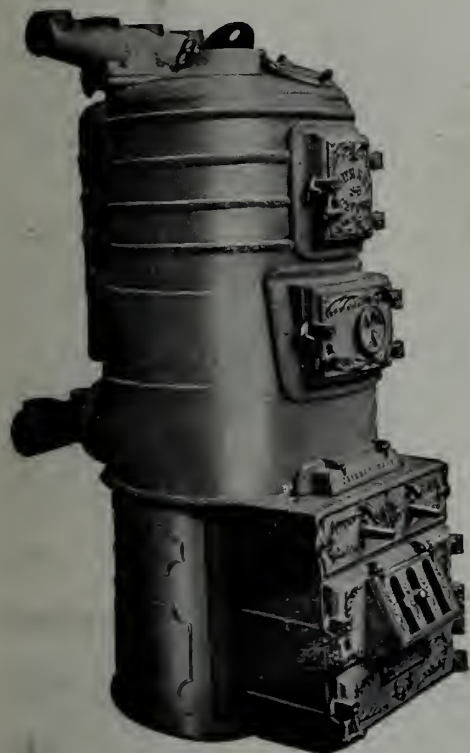
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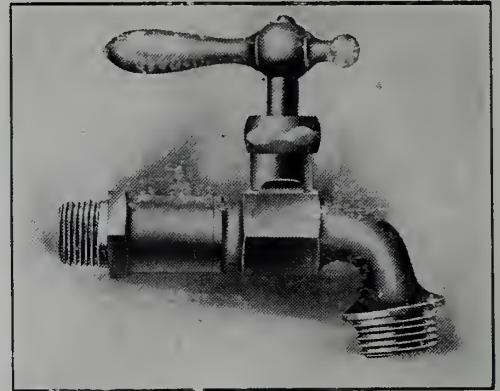
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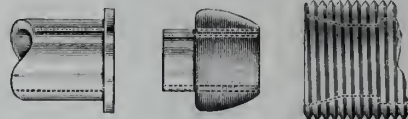
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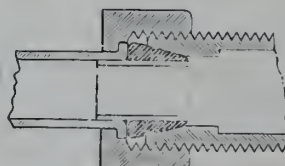
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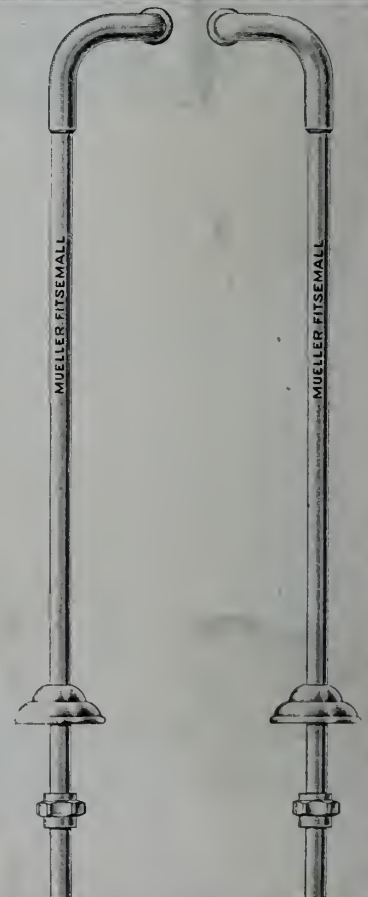
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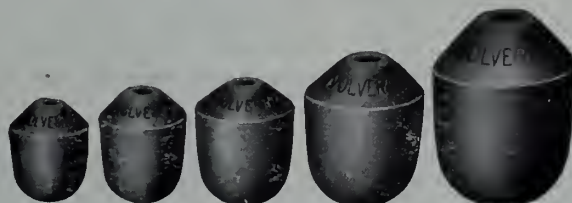
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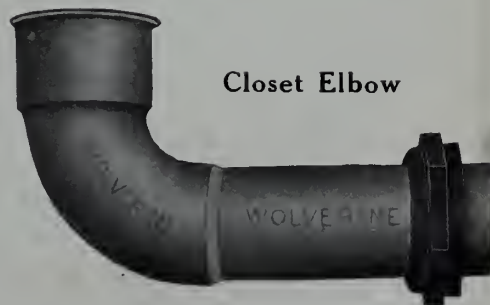
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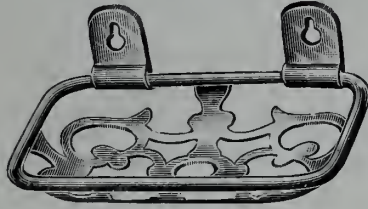
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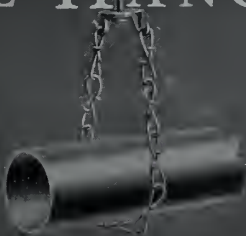
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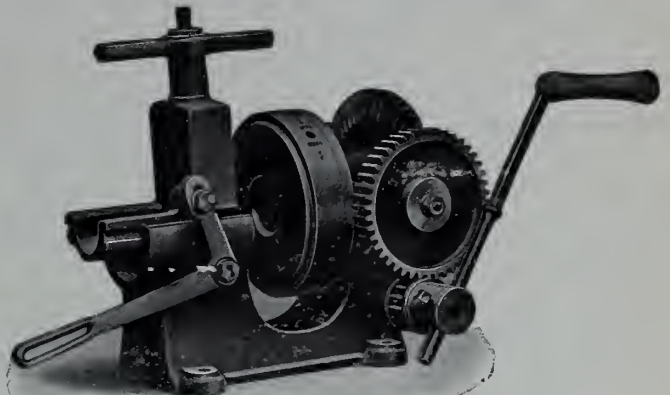
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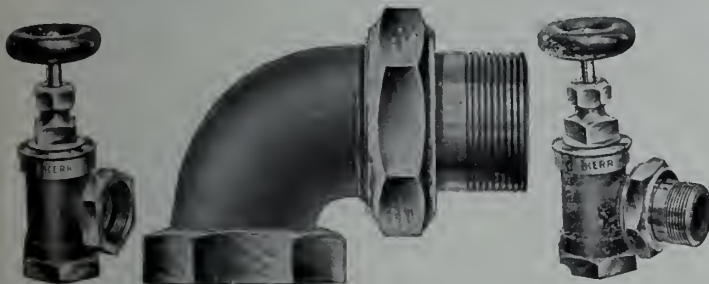
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MONTREAL, TORONTO AND WINNIPEG, MAY 20, 1908

COMING CONVENTIONS.

American Foundrymen's Association, Toronto, June 8 to 12.

National Association Master Plumbers, (also Master Steamfitters' Association), Boston, Mass., June 14 to 18.

American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., July 24 and 25.

Canadian National Master Plumbers' Association, probably at Quebec, about August 1.

PLUMBING WORK AND INSPECTION.

The Plumber and Steamfitter stands for the betterment and advancement of the plumbing trade in all its various phases, and believes that the higher the standard of the work the greater in the end will be the esteem and consideration with which the trade is held in the public eye. It also firmly believes that the general public is the greatest gainer by any action that stands for the best sanitary conditions possibly attainable.

The more fully the public is brought to appreciate the absolute necessity of good sanitary work, the higher will be the esteem in which the entire trade will be held, and the more fully the public is acquainted with the real benefits of modern sanitary apparatus, appliances and conditions, the greater will be the improvement in the health condition of every community.

Plumbers, master plumbers, inspectors, official bureaus under whose supervision all plumbing and sewerage work is brought, and the sanitary engineer under whose notice is brought the closest details of the work, are all absolute essentials of the modern community. The relation and importance of each to the general health condition of each and every individual, and the public as a whole can not to-day be neglected.

Adequate regulations to meet the necessity of modern sanitary requirements are essential to conditions of present-day life, and are of the greatest benefit to the entire public, though anyone who speaks of such a subject may from some individual standpoint be accused of an ulterior motive of selfish origin.

The working plumber, who is conscientious and painstaking in his everyday work, does more for improving the health conditions of the community than any other individual, and should be properly recompensed for his services.

The calling of the master plumber is worthy of the highest recognition by the public, and reasonable profits

must come to him in order that he can properly perform his proper function under present-day needs and conditions. The master plumber has every reason and right to demand proper recognition and profit to properly maintain the conduct of a business of such great importance to the welfare of every community.

The plumbing or sanitary inspector is also essential to the well being of the community and the better paid, the more careful and painstaking his work, the higher the degree of his requirements, the greater is the insurance to the public of the proper sanitary conditions and the better it is for every well-meaning and well-intentioned journeyman and master plumber. No person is in such a good position to know what should be required in all the various kinds of plumbing work as the inspector of plumbing. He has every opportunity for the closest observation and the widest experience. He should be, and is, the greatest friend of the well-meaning and well-intentioned plumber, and should be the enemy of the "shyster," "cheap John" and "skin" that might or may be created by loose sanitary regulations, and in his official capacity he is in a position to render a service to the public that can be rendered by no other individual. He has every opportunity from his own study and observations, from his conference with his associates, and by conferring with others acting in the same capacity in other towns and cities, a means to further the health interests and greater welfare of the plumber than all others.

The Plumber and Steamfitter stands fairly and squarely for "good plumbing work and more of it," knowing the advantages that accrue to the manufacturer, the master plumber, the journeyman plumber, the plumbing inspector, the sanitary engineer and the public in general—the latter of whom is benefited to the greatest extent by any and all fair and reasonable regulations for their welfare.

In the May issue of Business Philosopher, Arthur F. Sheldon says:

"In final analysis, the difficulties, municipal, national and international, rest with the individual. The individual is the unit in a business institution. Make each unit in the institution right and the institution is all right. Make each institution right and the community is all right. Make each community right and the state is all right. Make each state right and the government is all right. And make each government right and the world is all right."

What Sheldon says is applicable to everything that concerns those who have to do with any and all kinds of sanitary work, and sanitary conditions. Few, if any, other specific callings have the honor of receiving recognition at the hands of the public for its absolute necessity of existence, and this is all the more reason why the standard should be raised to the very best attainable.

At the meeting of Michigan Association of Master Plumbers, March 24, 1908, Thomas S. Ainge, sanitary engineer of the Michigan department, in part said, referring to the plumber in relation to sanitation.

"In the larger cities, where the right to do business is conditional upon the ability of the plumber, the question of the higher education of the plumber is a vital one and must be promptly and squarely met, and it is hoped that the time is not far distant when such a condition will be imposed upon the plumbers in every locality having a public water supply and sewers. The need for the examination of plumbers' work will be apparent to any one who will make a tour of the streets of the average city, and note the close proximity to windows which may be opened of the terminals of many soil pipes and of very many inlets to the house sewers. And if defects are apparent on the outside what would an examination of the interior and hidden pipes reveal?

"The enactment of laws and regulations for the control of plumbers' work, together with the proper and impartial enforcement of the same, will usually depend upon the attitude of the plumbers themselves in the matter.

One of the principal obstacles in the way of the proper enforcement of the plumbing laws and regulations is the meagre compensation of those engaged in this work. A plumbing inspector should be a man of considerable education and experience, a man without fear or favor, and one in whom the general public can repose confidence. Such a man, however, can not be obtained for the paltry salaries frequently allowed for such service, and the office will often be filled with a cheap man and his duties be discharged in a perfunctory manner.

"Do not wait for the other fellow to make the first move, for a plumbing board and for a plumbing inspector for your locality, or, if need be, for a better and more comprehensive law for your State.

"Finally, by your action, discourage the practice of cutting prices to or below the point where good work can be performed, and if you cannot secure your share of the contract work at a fair profit to yourself, let the other fellow have it. He won't last long on that tack, and your work will show up well when placed in comparison with the cheaper work and prove to be your best advertisement."

Six Canadian cities are to-day, to our knowledge, considering the necessity of more comprehensive regulations for sanitary work. They are Montreal, Hamilton, London, Winnipeg, Vancouver and Victoria. Probably others are doing so, and if they are not they should do so.

The Plumber and Steamfitter affords to all in any way interested in sanitation, the latest and best information along these lines. In its columns will be found from time to time reproduced the regulations in force in the

principal cities on this continent, together with the latest information along all lines that concerns those most directly interested in establishing and maintaining healthful conditions in the communities in which they live.

FEATURES IN NEXT ISSUE.

Following the article in this issue of The Plumber and Steamfitter, comparing the plumbing regulations in force in over a score of Canadian and American cities, Mr. George Clapperton, of the Bennett & Wright Company, Toronto, has promised to present his opinions on the subject of the Toronto practice of allowing tile pipe to be used under cement floors inside the walls of houses, he also comparing the cost of terra cotta, tile and iron pipe. Another prominent Toronto master plumber has promised to outline where the practice is in advance of the requirements of the actual printed by-laws, a resume of which is given on another page. While not definitely promised, an article outlining the situation in Winnipeg is also expected for publication. Other articles in hand include one by M. J. Quinn, consulting engineer, Toronto, on septic tanks, answering inquiries received from two readers, and "Plumbing in Olden Days," an article reminiscent of the past, by Mr. J. W. Hughes, Montreal.

In connection with the discussion in this week's issue, the large sectional plan illustrating the requirements of the trade at Washington, D.C., will prove interesting for study and reference by the trade in all parts of Canada.

MONTREAL'S DRINKING WATER.

Montreal has several distinct civic peculiarities, and one is the excessive rate that the citizens pay for water that they cannot, without the courage of heavy life insurance, drink. As a profit-bearing scheme the present use of the St. Lawrence is a magnificent one, but as a means of supplying the all essential fluid, it is most deplorable, and those who have any regard for their health are compelled to buy their drinking water from a private concern. The St. Lawrence was once a pellucid river, but its glories in this direction have long departed. Towns, hospitals and factories drain into its course before the intake for Montreal is reached, and the water unfiltered is conveyed into every Montreal house and drinking fountain, to relieve the thirst of man, woman and child. Typhoid is always epidemic, while last fall the city hospitals were full of patients, and many medical men were of opinion that the water supply was largely responsible. Be that as it may, the water is certainly none too clean, and on occasions when filtration is brought into practice privately, a sediment is left that certainly to the uninitiated is none too inviting, nor an encouragement to total abstinence.

The plumbing trade is certainly well acquainted with the dreadful state of the water for their services are frequently being required for the purpose of removing peculiar objects, alive and dead, which have lodged in the pipes. Plumbers generally denounce the water in no uncertain way, they have so many evidences before their eyes of its pollution.

If no other course was open to the authorities except the use of the St. Lawrence, there might be some excuse. But about 40 miles from Montreal there are the Laurentian Mountain Springs, which give out water that is the purest to be found on the North American continent, the water which citizens now pay to have supplied to them in bottles by a private concern. This water could be brought to the city without pumping by pipes, and the distance is but trivial compared with the distances that

other cities have gone. It is high time that the authorities should take steps to remedy the water evil. Cost is hardly to be considered when the health of the citizens are concerned. The plumbing trade can do much good by continually preaching as to the state of the water, and as to the condition of the pipes as they often see them.

IMPROVING THE STANDARD.

Credit is due Canadian manufacturers for their efforts to improve the quality of plumbing supplies manufactured in Canada. There was a time when Canadian products could only be installed on jobs where architects had failed to specify any particular make or grade of goods. This is all changed, however, and a steadily increasing number of architects are calling for lines made in this country, the Toronto city architect's expression of appreciation of the improvement in Canadian goods being an indication of the change that is taking place.

The Standard Ideal Manufacturing Company, Port Hope, to whom much credit is due in this regard, are making another advance in issuing a new catalogue equal in every particular to the splendid "Standard," "Mott" and "Wolfe" catalogues published in the United States. Advance proofs show not only a magnificent illustrated book, but also a large number of new designs of fixtures, making a selection as wide as could be desired by any architect or plumber doing business in Canada.

BAD PLUMBING AND DISEASE.

At the annual meeting of the Indiana State Association of Master Plumbers it was decided to appeal to the General Assembly, next winter, for a plumbers' inspection or health law. This move was brought about by the fact that much disease—measles, typhoid and scarlet fevers and other sicknesses—was due in considerable degree to inefficient plumbing. A State department will, without doubt, elevate the plumbing business and raise the standard of work. Indiana is one of the few States lacking such a department. Statistics show that disease has decreased 60 per cent. in Massachusetts since the enactment of a plumbing inspection law.

AN AMERICAN INVASION.

The increasing desire of the large American manufacturers to establish factories in this country is a striking acknowledgment of the development of the Canadian plumbing and heating trade. There is no better judge of a good commercial opening than the American manufacturer, and the fact that he should be casting covetous eyes in this direction is to us a gratifying appreciation of our great business possibilities, and, at the same time, an evidence of his own good sense.

In common with all other industries, the plumbing and steamfitting trade has made gigantic strides in recent years, and a vast field is opening up for manufacturing enterprise. No country is more progressive in its plumbing and heating systems than we are, and no more intelligent body of men collectively are engaged in the trade. We do not claim perfection by any means in either direction, as, in fact, no country can. But we do claim for Canada that progress in theory is well backed up by practice, that no good article is placed upon the open market, which, if suitable for usage here, does not command ready employment, that the people generally are becoming more and more appreciative of the value of the best in plumbing, and the trade quite as willing to supply it. We have our shoddy plumbing as other countries have theirs, we have our market for cheap appliances and furn-

ishings like the rest, but we also have a great and developing market that is anxious to use the best and the most up-to-date class of goods that the ingenuity of man can turn out.

The sale that many American houses command for their goods, despite export disadvantages, shows the opportunity that lies before these people. If a factory, say in New York, can find in Canada a good and profitable market for its products, how much more profitable could this market be made if the articles in question were Canadianized. A branch office has but a minor effect compared with what a domestic factory could do. The disadvantages of duty, the distance between the base of production and the field of operations, the difficulty of meeting certain peculiarities of demand which may exist, would all be done away with. To gain the full profit of a trade it is necessary to become as closely identified with it as possible, and realizing that this profit, as it applies to Canada is worth having now, and very much more so later on, American manufacturers are, one by one, seeking that identification.

A representative of Plumber and Steamfitter who recently traveled in the States was impressed by the evidences observable on all sides of the determination of the various large manufacturers to establish factories here, not only to hold the trade they have already secured, but to take a share in the greater prosperity that is coming. They were fully convinced as to the wisdom of the course. They were but waiting the opportune time—the time which may come along at any moment. Americans who have gained an insight into the Canadian market, who have become acquainted with the great trading possibilities of the country, are in no half-hearted mind as to the greatness of Canada's future. Their desire to participate in it as a home concern is a sufficient indication.

PLUMBERS PROTECT THE PUBLIC.

Whatever may be said of the plumber by the irresponsible public, those who are best informed about his work in all of its bearings cannot but realize that the public is indebted to him for valuable protection, says the Metal Worker. It is hardly necessary to point out that wherever the voice of the plumber has been heard he has assisted boards of health in insisting that the best plumbing shall be provided, and where these influences have prevailed the health of the people has shown improvement. When the people are ignorant of the necessity of safeguards to health it is the plumber who labors with the lawmaking powers to secure the enactment of regulations which will prevent the contamination of water supplies and work for proper disposal of sewage. When operation builders are willing to install villainous contrivances it is the influence and activities of the plumber that have provided a public inspector to see that proper plumbing is followed and that the equipment will obviate not only the nuisances common to plumbing of half a century ago, but also the dangers which attend the use of out-of-date equipment. When new devices are brought out it is the plumber who passes upon them and saves the public, which is incompetent to select intelligently, the expense of replacing an illy-contrived apparatus. If the plumber is wise he will cultivate the presentation of these facts in a dignified way, an act which will revert to his benefit and to the benefit of his patrons. To neglect keeping these facts before the public is to neglect an important duty. The plumber is too valuable a factor as a conservator of sanitation to permit libels upon his industry to pass unrebuked. It only needs a dignified presentation of the facts about the plumber's work to create a wider appreciation of its value.

Sanitary Requirements of Different Cities

An Analysis of the Plumbing Regulations Governing Plumbers and Plumbing in a Score of Canadian and United States Cities—Actual Practice in Many Cases in Advance of the Requirements.

In this issue is presented, in specially prepared schedules, the major portion of the requirements of various cities in reference to their plumbing regulations. We believe there has never before been presented such a resume of the by-laws and ordinances of various cities on this continent in such a concise form. The presentation of the conditions as here set forth are of interest to every owner of property, agent, lessee, architect, contractor, plumber, sanitary engineer,

tions that may or might be placed on such regulations.

Probably one phase of the subject is brought out fairly clear, and that is the less the necessity of interpretation on the part of the public officer, and the nearer the regulations adhere to the direct and absolute mandate of the law (within certain restrictions and allowances) the easier and more fully are carried out the real duties of the inspector, the better and higher is the

phases of the subject, adaptable to the needs of everyone, are brought out that are well worthy of consideration. Through the investigations and inquiries made some data and interesting information is forcibly brought to notice.

Canadian cities, and Toronto in particular, are in advance of all other cities on this continent in that the sewer work and all tapping of sewers and the laying of private drains or house connections to drains up to the

DATA RELATIVE TO PLUMBING BY-LAWS OF VARIOUS CITIES.

	Population.	Examination of Journeymen.	Examination of Master Plumbers.	Fee for Journeymen.	Fee for Master Plumber.	Bond for Master Plumber.	No. of Masters Registered.	License Fee.	Term of License.	Maximum Penalty for Violation.	Examination of Inspectors.	No. of Inspectors.	Ratio to Population	When By-Law Revised.	New By-Laws being Prepared	Under What Department.
Toronto	275,000	None	None	None	None	None	247	\$1		\$50 fine or 6 mo	None	7	1 to 39,000	1894	No	Health.
Montréal	370,000	Partial.	Partial.	None	None	Yes	257	\$5	Year		None	7	33,000	1903	Yes	Health.
Winnipeg	111,000	None	None	None	None	None	60	None			None	4	27,500	1899	Yes	City Engineer.
Hamilton	65,000	No regulations	No regulations	in force	in force										Yes	Health.
London	50,000	No regulations	No regulations	in force	in force										Yes	Health.
Ottawa	80,000	None	None	None	None	None	36	\$5		\$50 fine or 6 mo	None	1	80,000	1903	No	Health.
St. John	45,000	None	None	None	None	None	None	None		\$10 fine	None	1	45,000	1898	No	Health.
Vancouver	35,000	None	None	None	None	\$25 dep.	20	\$10		\$50 and forfeit	None	1	35,000	1904	Yes	Plumbing.
Portland	70,000	Yes	Yes	None	None	\$500	30	\$10		None	None	2	35,000	1896	Yes	Health.
Washington	340,000	None	Yes	None	\$3	Yes	196	Exam.	5 years	\$100 or 6 months.	None	2	37,500	1907	No	Plumbing.
Baltimore	573,000	Yes	Yes	None	\$1	No	20	None		\$20 and \$2 per day	None	2	72,000	1907	No	Health.
St. Louis	600,000	Yes	Yes	\$1	\$1	\$2,000	450				None	2	75,000	1889	No	Plumbing.
Kansas City	280,000	Yes	Yes	\$10	\$10	\$2,000	119			\$200 and forfeit	None	3	193,000	1898	No	Plumbing.
Denver	200,000	State Law	Compulsory	None	None	None	10	None		\$100	None	3	66,000	1906	No	Health.
Rochester	200,000	State Law	Compulsory	\$2,000	\$2,000	None	90	None		Fine and forfeit	Yes	4	50,000	1907	No	Public Safety.
Buffalo	410,000	State Law	Compulsory	\$5	\$5	None	153	None	Year	Fine and forfeit	Yes	7	6,000	1905	No	Health.
Pittsburg	510,000	Yes	Yes	50 cents	\$5	None	650	None		\$25 or 30 days.	None	12	42,500	1911	No	Public Safety.
Toledo	185,000	Annual registration	Ratio	\$2,000	\$2,000	None	95	None	Year	\$500 or 3 months.	None	1	185,000	1907	No	Building.
Duluth	75,000	State Law	Compulsory	\$1,000	\$1,000	Yes	25	\$5	Year	\$50	Yes	1	75,000	1903	No	Health.
Albany	100,000	State Law	Compulsory	Yes	Yes	Yes	125	\$5	Year	Fine and forfeit	Yes	2	50,000	1901	No	Health.
Cincinnati	450,000	No	None	None	None	\$500	211	\$3	Year		Yes	5	90,000	1903	Yes	Building.
Milwaukee	350,000	Oath	as to experience	None	\$1,000	None	156			Fine and forfeit	None	6	60,000	1903	No	Public Works.
Columbus	200,000	No	None	None	None	None	70	50c. per permit	None	\$50	None	3	66,000	1907	No	Building.
Hartford	130,000	Yes	None	None	None	None	63	\$1	Year	Forfeit license	None	1	103,000	1908	No	Health.
Newark	310,000	Yes	Yes	Yes	Yes	\$1,500	803	\$5 & \$2 ea. per fixture	Year	\$100	None	4	78,000	1902	No	Health.
Omaha	135,000	Yes	Yes	Yes	Yes	\$1,000	70	50c. per fixture	Year	\$50 and forfeit	None	1	135,000	1905	No	Building.

Note—Newark registration includes journeymen.

inspector, and the members of the Boards of Health of every municipality and province.

This table, or resume, is not presented as a criticism, either adverse or favorable, of any one by-law or another, but for the purpose of presenting to our readers and the general public the status of regulations as literally interpreted from the published by-laws.

It does not deal with the practice under the opportunities of specific applications from general regulations, according to the interpretations that may be placed upon such regulations, but deals only with the literal interpreta-

status of the plumber, and the greater the security to the public.

The tables as compiled, are subject to revision, according to the practice as held in various cities, or otherwise, and are presented with the desire that they may be of value and interest to every Board of Health, or supervising department in charge of sanitary affairs, plumber, architect, inspector, owner and lessee.

Where Canadian Cities Lead.

Particularly interesting they should be to every municipality contemplating a change in their plumbing by-laws, as

building line are under the direct control of the municipality, thus avoiding many unnecessary complications and loss of time upon the part of persons directly or indirectly otherwise held responsible in connection with the execution of each work.

In many cities on the other side, unfortunately, according to their system, the plumber (or drain-layers work) starts at the connection with the sewer or water main directly and he has to assume a certain share of responsibility beyond what would appear to be his just and proper province.

In Indianapolis the peculiar situation

presents itself that there is no plumbing inspector or department of sanitation that has any supervision over the interior work of the building in so far as the plumbing work is concerned, nor are there seemingly any direct requirements concerning such work, except

one for 135,000, while Washington has one for 37,500 (this includes a chief of division), and Pittsburg one for every 42,500 people. In Toronto (without subdividing the nature of responsibilities) there is one for each 39,000, and in Montreal one for every 53,000, in Otta-

schedule are considering new by-laws in reference to the needs of their sanitary requirements.

Considering the several requirements of by-laws, ordinances and regulations which have been brought to our attention, there appears to be a tendency to

COMPARATIVE TABLE OF PLUMBING REQUIREMENTS IN VARIOUS CITIES ACCORDING TO PRINTED BY-LAWS OR ORDINANCES.

Requirement.	Washington.	Rochester.	Pittsburg.	Toronto.
Separate and direct service	Yes	Yes	Yes	Not required.....
License may be suspended	For bad work.....	Forfeited.....	Revoke for 90 days.....	Not covered.....
House drain (inside)	Cast iron	Tile conditionally.....	Tile conditionally.....	Tile with exception.....
House lateral (tile or vitrified pipe).....	Conditionally	Conditionally.....	Conditionally	Tile with exception.....
Limit of tile pipe	20 feet of wall.....	3 feet of wall.....	5 feet of wall.....	No requirement.....
House service size defined according to area roof or lot	Yes	Yes	Not less than 6 ins.....	Not definite.....
Surface drain with strainer	No	No	Not covered.....	Not covered.....
Hot liquids, vapors or gases to service	Not permitted	Not permitted	Not permitted	Not permitted.....
Range boiler sediment cocks direct	No	Not covered.....	Not covered.....	No
Drains to be above ground	Yes	Not covered.....	Not covered.....	Not covered.....
Smallest size soil pipe	3-inch	4-inch.....	4-inch.....	4-inch.....
Relieving wall arch in wall for pipe	Yes	Yes	Not covered.....	Not covered.....
Venting of fixtures—exception	Top or only closet not over 2 ft. from stack	Various exceptions.....	Not excepted.....	No exception.....
Horizontal vents under floors	Not over 2 feet.....	Not covered.....	Not covered.....	Not covered.....
Size of vents specified	Yes	Yes	Yes	Yes
Trap and waste, same size	Yes	Yes	Not covered.....	Yes
Safe and pan drips	No direct connection.....	No direct connection.....	No direct connection.....	No direct connection.....
Designating marks and maker's name cast on cast soil pipe	Yes	Not covered.....	Yes	Not covered.....
Wrought iron waste, soil and drain permitted	Yes	Yes	Yes	Not covered.....
House sewer trap	Yes	Yes	Yes	Yes
Air inlet	Yes	Yes	Automatic.....	Yes
Direct ventilation and light for rooms with water-closets required	Yes	Yes	Yes	Not covered.....
Apartments separate from sleeping rooms required for water closets.....	Yes	Yes	Yes	Not covered.....
Pan, valve, plunger and offset closets allowed.....	No	No	No	No
Size of flush-pipe defined	Yes	Yes	Yes	Not covered.....
Defective and non-approved fixtures may be condemned and removed	Yes	Yes	Not covered.....	Not covered.....
Provision for outside closets	Yes	Not covered.....	Yes	Not covered.....
Closet connection specified	Yes	Not covered.....	Yes	Not covered.....
Bath tub compulsory for each suite of family apartments	Yes	Not covered.....	Not covered.....	Not covered.....
Wooden copper-lined tubs permitted	No	Not covered.....	No	Not covered.....
Defective tubs may be condemned	Yes	Yes	Not covered.....	Not covered.....
Storage tanks required where water supply is not ample	Yes	Yes	Yes	Not covered.....
Rainwater leaders to be trapped	Yes	Yes	Yes	Partly covered.....
Rainwater leader inside house cast iron	Yes	Yes	Cast or wrought.....	Not covered.....
Disposal of rainwater can be enforced	Yes	Not covered.....	Yes	Not covered.....
Overflows and drip direct to sewer	No	No	No	No
Wooden wash traps permitted (except for certain purposes)	No	No	No	Not covered.....
Trap vents or sewer ventilation to chimneys.....	No	Not covered.....	No	Not covered.....
Tests of soil, waste and vent pipes	3 lbs. air pressure.....	Water test.....	Water test.....	Water test.....
Final inspection	Peppermint or smoke.....	Smoke test optional.....	Air or peppermint.....	Smoke.....
Repairs and extensions defined	Yes	Not definitely.....	Closely defined.....	Not definite.....
Defects and improper material defined	Yes	Not definitely.....	Yes	Not definite.....
Means for dispensing with terra-cotta house sewers	Yes	Not provided.....	Yes	None.....
Local vents	Not required	Not compulsory.....	Not required.....	Required.....
Yoke ventilation	Provided for.....	Provided for.....	Provided in part.....	Not mentioned.....
Back vent lines independent of main stack.....	Provided for.....	Partially covered.....	Provided for.....	Not definite.....

Note.—"Not covered" and "not definite" refers to specific clauses, though general clauses subject to interpretation may exist in some cases.

those that apply to drains and water connections. What are the conditions in practice it might be interesting to learn.

The general average of inspectors in cities seems to be about one to a population of 60,000, but Toledo has only one for 185,000 people and Omaha only

wa, one for every 80,000, and St. John, one for every 45,000 people.

Canadian Cities Revising Laws.

Another condition shown by the investigation and reports of Plumber and Steamfitter is that six out of nine cities in Canada reported and shown in our

permit the use of various systems of plumbing work in so far as it is properly done in detail in accordance with the necessary requirements of such work, that plumbing or sanitary work should and ought to be in the hands of those properly trained and versed in the work and these only; that any by-law should

be as concise and comprehensive within itself, without reference to other laws, as possible; that the subject of sanitation and all relevant matters should be considered as a whole in connection with all such regulations; that terra cotta or tile pipe inside the house is not generally acceptable and that there are other and better uses for such materials; that good and sufficient regulations covering apartment houses, flats, tenement and lodging houses are required and necessary; that local vents (ventilation pipes of small size) are not generally considered adequate but that all apartments containing closets and baths should have direct connection with outside light and air; that all alterations beyond that which may be classed as repairs, of any plumbing system should be under inspection and supervision; that what constitutes repairs should be closely and distinctly defined, beyond the chance of misinterpretation; that the venting of fixtures in all cases is not essential; that non-siphon traps are permissible for certain uses, and that certain definite and clearly detailed regulations are essential in the interest of the plumber, the inspector and the public at large.

In our columns from time to time will be presented every phase of this most interesting subject, and we trust all will avail themselves of the opportunity for interchange of ideas through these columns.

FOR BETTER PLUMBING IN CANADA.

The Metal Worker, New York, (May 2) commenting on recent articles in The Plumber and Steamfitter, says:

"Encouragement should be given those who devote their energies to measures which will benefit the public health, as is being done at the present time by plumbers and sanitarians in two Canadian cities. As a rule when the master plumbers engage in an effort to induce city authorities to provide plumbing regulations the charge is immediately made that their activities are for selfish purposes. This is unfortunately the attitude of some who should lend their assistance and influence in procuring advanced modern regulations for the installation of plumbing equipment and for the examination to determine the competency of those who seek licenses to do such work. It has long since been demonstrated in the United States that the effect of sanitary equipment upon the health of the occupants of any building is such that it is worthy of being protected to the extent of requiring master plumbers to pass an examination which will demonstrate their thorough acquaintance with the proper installation of house drainage systems and their competency to see

that the work executed by their employes is of a highly sanitary efficiency. In the United States the work has not stopped with the provision of legislation which leaves very few points in the actual work to the discretion of the plumber and which provides that plumbers must have a license showing their competency, but has gone further in providing a public official to inspect the work as it progresses and see that no deviation is made through intention or neglect from prescribed best practice.

"The Metal Worker congratulates its contemporary, The Plumber and Steamfitter of Canada in urging the plumbers and health officers in both Hamilton and Toronto to secure for the citizens of these important centres of population the same excellent safeguards for the public health as have been demonstrated to be of great benefit to the people in the United States. It is a matter of common information that the American Society of Inspectors of Plumbing and Sanitary Engineers has been organized in order that men who design and supervise the installation of water supply and house drainage systems may meet and exchange experiences gained in actual practice, in order that plumbing regulations may be more widely adopted and advanced methods of sanitation more widely followed. Some states have provided in connection with the health board a state sanitary engineer, prepared to give expert information wherever cities or hamlets may need it. The records of these state boards of health can be secured by Canadian friends and will conclusively show that wherever sanitary equipment is installed under exacting regulations there has been a decided falling off in the death rate and a corresponding improvement in the health of the citizens. Here is ample reason for public officers and those who cater for the favors of the public to adhere rigidly to the most advanced and rigid observance of all rules and practices that contribute to the public health."

First-class Work Essential.

Domestic Engineering (Chicago) of May 16, says:

"Toronto and Hamilton, Canada, are suffering from the results of price-cutting and cheap work in the plumbing business. The Plumbing Inspection Department of Toronto, it seems, has become very lax in its inspection work and actually suppressed information in regard to poor work that should have been made public. Our esteemed contemporary, The Plumber and Steamfitter of Canada, has taken official notice of the existing conditions and is making a determined effort to arouse interest in the state of affairs so that some effectual remedy may be applied.

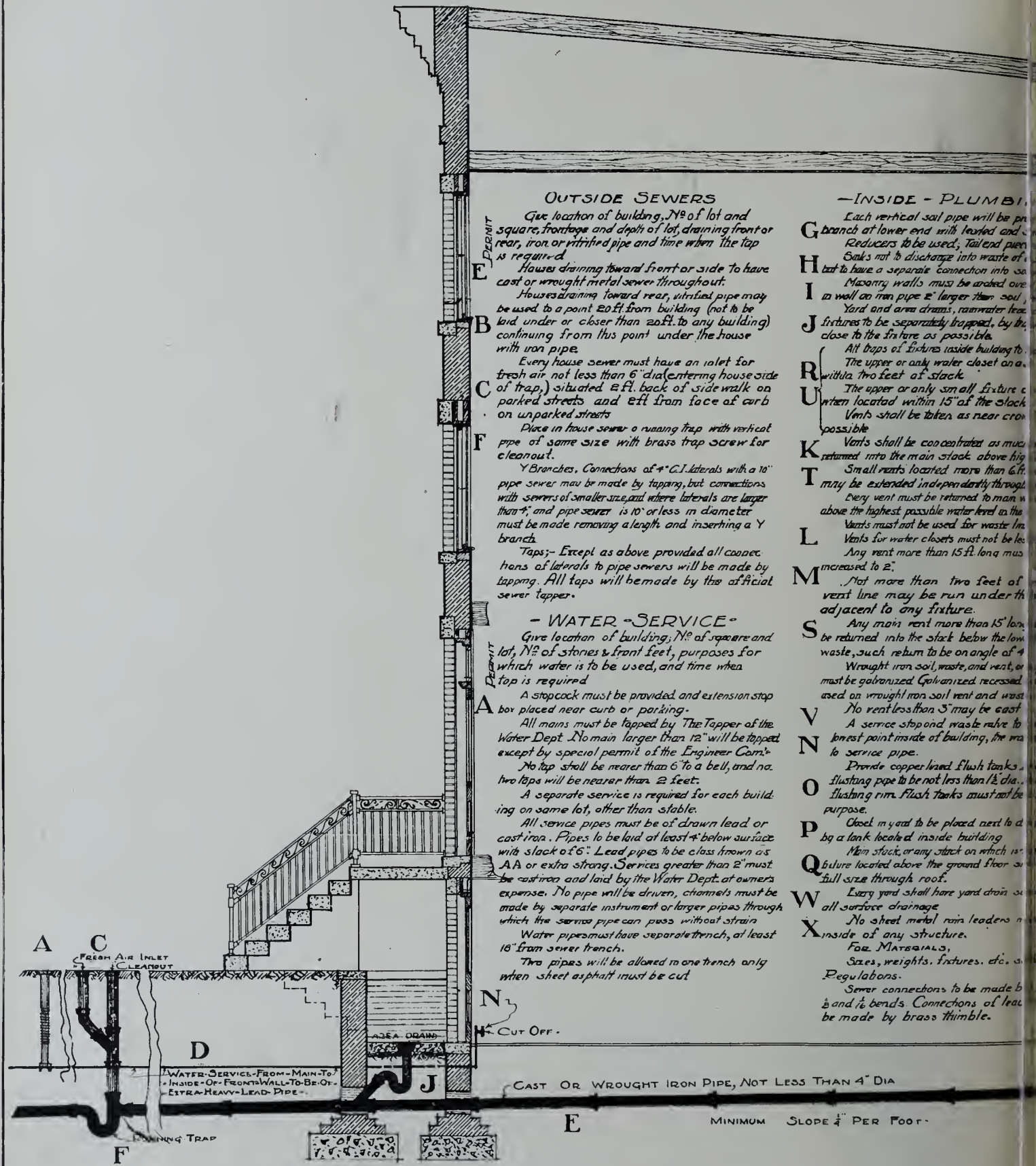
The efforts of The Plumber and Steamfitter should have the support of every plumber who has the best good of his own business and of the craft as a whole, at heart. First-class plumbing is absolutely essential to the health of any community and under existing conditions it is not likely to be obtained unless some recognized standard is established and enforced by rigid inspection, so as to protect the high grade workman from the cheap methods and practice of the cut-throat contractor."

HONEYWELL COMPANY'S CANADIAN PLANT.

The Honeywell Heating Specialty Co., of Wabash, Ind., whose specialties are recognized as standard articles not only by the plumbing and heating trade of the United States, but of Canada, as well, are taking steps to establish a factory in Montreal, so as to cope more effectively with the growing demand that has sprung up for their goods in the Dominion. The undertaking is not a light one, as it will be necessary to import special machinery which cannot be procured here, and which the Honeywell Specialty Company make for themselves, but the company wish to manufacture on Canadian soil, so that they can identify themselves more closely with Canadian trade. The Honeywell heat generator, the Honeywell unique radiator valve, the Honeywell thermostat or automatic damper regulator, and other specialties of a similar kind, will, by being manufactured here, be saved the disadvantage of a duty, and thus be sold to the trade at the same prices that obtain in the States. This is a feature that will commend itself to the trade generally.

The Honeywell Specialty Company intend to waste no time in getting to work on their Canadian venture, and as soon as the arrangements for a Montreal location are through, the necessary plant will be assembled, and manufacturing will be started. M. D. Tillman, who is vice-president of the company, is in Montreal superintending all arrangements, and he is rapidly organizing matters into practical shape. Mr. Tillman will call on the trade throughout the Dominion, and no steps will be left unturned to secure as prominent a position for the various specialties of the company in Canada as they hold at the present time in the States.

The Honeywell factory at Wabash, Indiana, is an extensive one and a large staff of employes are necessary to cope with the great trade done. As we have said, special machinery is required for the many specialties of the company, and with an elaborately equipped engineering and draughting department, manufacturing is done under conditions that ensure the best workmanship combined with artistic finish and durability of material. M. C. Honeywell is president of the company, M. D. Tillman vice-president, J. C. Teague secretary, and H. H. McNamee treasurer.



OUTSIDE SEWERS

Give location of building, No of lot and square, frontage and depth of lot, draining front or rear, iron or vitrified pipe and time when the tap is required.

Houses draining toward front or side to have cast or wrought metal sewer throughout.

Houses draining toward rear, vitrified pipe may be used to a point 20 ft. from building (not to be laid under or closer than 20 ft. to any building) continuing from this point under the house with iron pipe.

Every house sewer must have an inlet for fresh air not less than 6" dia. (entering house side of trap,) situated 2 ft. back of side walk on parked streets and 2 ft. from face of curb on unparked streets.

Place in house sewer a running trap with vertical pipe of same size with brass trap screw for cleanout.

Y Branches. Connections of 4" C.I. laterals with a 10" pipe sewer may be made by tapping, but connections with sewers of smaller size, and where laterals are larger than 4", and pipe sewer is 10" or less in diameter must be made removing a length and inserting a Y branch.

Taps. Except as above provided all connections of laterals to pipe sewers will be made by tapping. All taps will be made by the official sewer tapper.

- WATER SERVICE -

Give location of building, No of square and lot, No of stories & front feet, purposes for which water is to be used, and time when tap is required.

A stopcock must be provided and extension stop box placed near curb or parking.

All mains must be tapped by The Tapper of the Water Dept. No main larger than 12" will be tapped except by special permit of the Engineer Commr.

No tap shall be nearer than 6" to a bell, and no two taps will be nearer than 2 feet.

A separate service is required for each building on same lot, other than stable.

All service pipes must be of drawn lead or cast iron. Pipes to be laid at least 4" below surface with slack of 6". Lead pipes to be class known as AA or extra strong. Services greater than 2" must be cast iron and laid by the Water Dept. at owners expense. No pipe will be driven, channels must be made by separate instrument or larger pipes through which the service pipe can pass without strain.

Water pipes must have separate trench, at least 18" from sewer trench.

Two pipes will be allowed in one trench only when sheet asphalt must be cut.

- INSIDE - PLUMBING -

Each vertical soil pipe will be provided with a branch at lower end with leaded and soldered.

Reducers to be used. Tail end piece of pipe not to discharge into waste of another fixture.

Soak pits to have a separate connection into sewer. Masonry walls must be arched over.

In wall an iron pipe 2" larger than soil pipe. Yard and area drains, rainwater leaders.

Fixtures to be separately trapped, by the close to the fixture as possible.

All traps of fixtures inside building to be trapped with a trap.

The upper or only water closet on a floor within two feet of stack.

The upper or only small fixture on a floor located within 15' of the stack.

Vents shall be taken as near cross as possible.

Vents shall be concentrated as much as possible into the main stack above high water level.

Small vents located more than 6 ft. from main stack may be extended independently through roof.

Every vent must be returned to main stack above the highest possible water level in the stack.

Vents must not be used for waste line. Vents for water closets must not be less than 12" in diameter.

Any vent more than 15 ft. long must be increased to 2".

Not more than two feet of vent line may be run under the ground adjacent to any fixture.

Any main vent more than 15' long must be returned into the main stack above high water level, such return to be on angle of 45°.

Wrought iron soil, waste, and vent, or must be galvanized. Galvanized increased to 2".

used on wrought iron soil vent and waste. No vent less than 3" may be cast.

A service stop and waste valve to be placed at lowest point inside of building, the waste to service pipe.

Provide copper lined flush tanks. Flushing pipe to be not less than 1/2" dia.

Flushing rim. Flush tanks must not be used for any other purpose.

Stack in yard to be placed next to building by a tank located inside building.

Main stack or any stack on which a fixture is located above the ground floor or full size through roof.

Every yard shall have yard drain to all surface drainage.

No sheet metal rain leaders to be used inside of any structure.

For Materials, Sizes, weights, fixtures, etc. see Regulations.

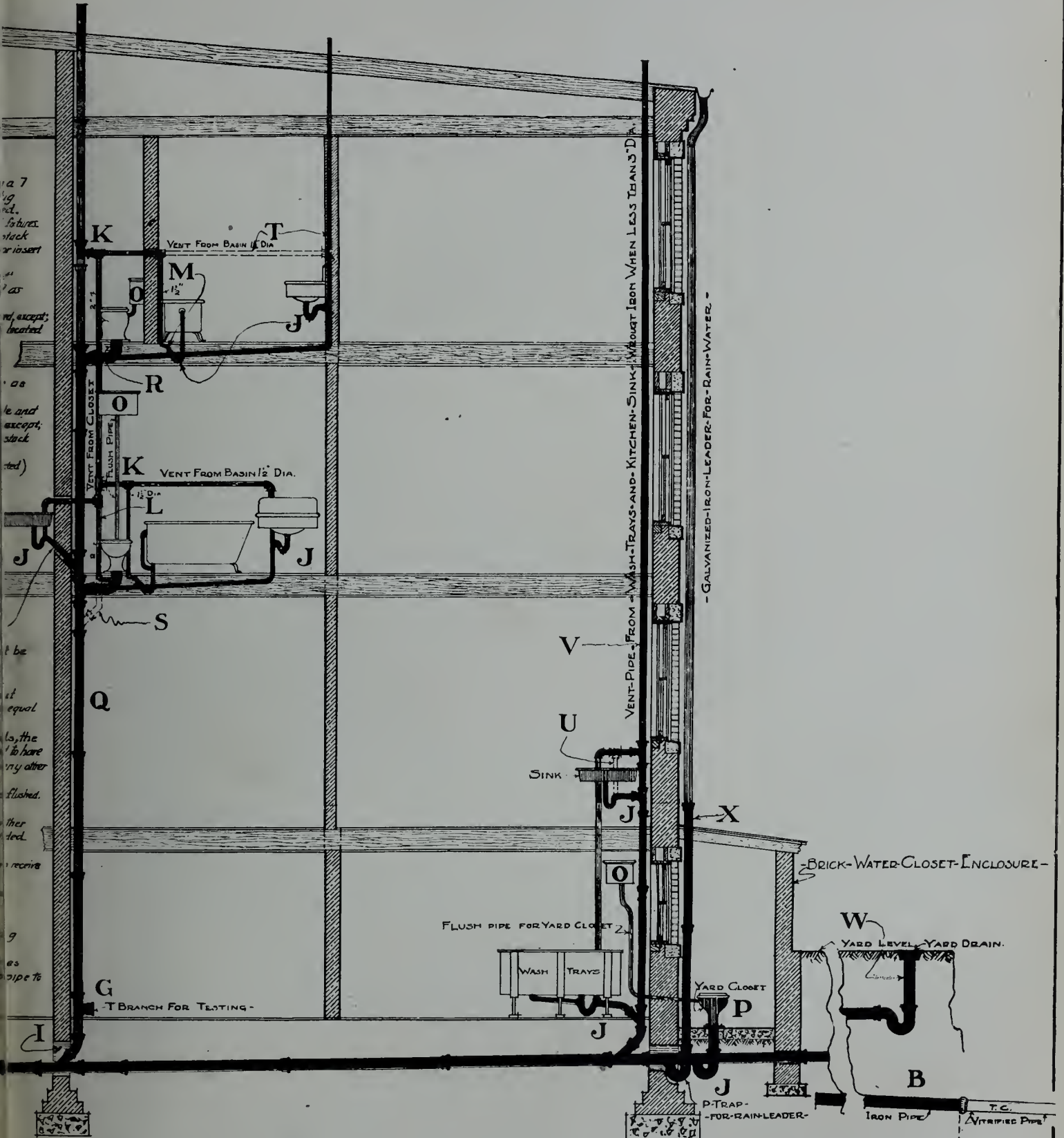
Sewer connections to be made by lead and 1/2" bends. Connections of lead to be made by brass thimble.

CAST OR WROUGHT IRON PIPE, NOT LESS THAN 4" DIA

MINIMUM SLOPE 1/4" PER FOOT

- SECTION - S

- SCALE 1/4" INCH TO 1 FOOT -



G-SYSTEM-OF-HOUSE-PLUMBING-
IN THE
DISTRICT-OF-COLUMBIA-

DRAWN BY A. M. GONZALEZ AND R. B. HUGHES
Nov 22, 1905

APPROVED *Henry B. Hayes*
INSPECTOR OF PLUMBING, D.C.

Determining Amount of Radiating Surfaces

Simplified Methods of Estimating Radiation—Another Article on This Subject Written for the Plumber and Steamfitter by C. E. Oldacre, Toronto.

In the proportioning of radiating surfaces for large buildings or spaces a greater variation of conditions is met with than in small buildings or private houses.

These variations may be in regard to the temperature required, the constancy of the heating, the amount of exposure, the amount of glass surface, the relation of the exposed glass and wall surface to the cubical contents, the space occupied by the contained goods and machinery, the thickness of the walls, the kind of walls or the number of floors of the building which may require heating.

In such cases the radiation can not be proportioned with any certainty of results on a basis of allowing any certain

30x100 feet and 10 feet high. The only exposed walls are the two front and rear walls. It is to be assumed that there are buildings on each side—the two storey building on one side and on the other the adjoining building is as high or higher than the building under consideration. Each exposure is then 30x10 or 300 square feet or a total of 600 square feet. In each of the exposed walls there are four windows 4x8 feet, equal to 32 square feet of glass surface and for the eight windows there is a total glass surface of 256 square feet, leaving a net wall surface exposed of 344 square feet. Here the relation of the surfaces to the cubic contents would be:

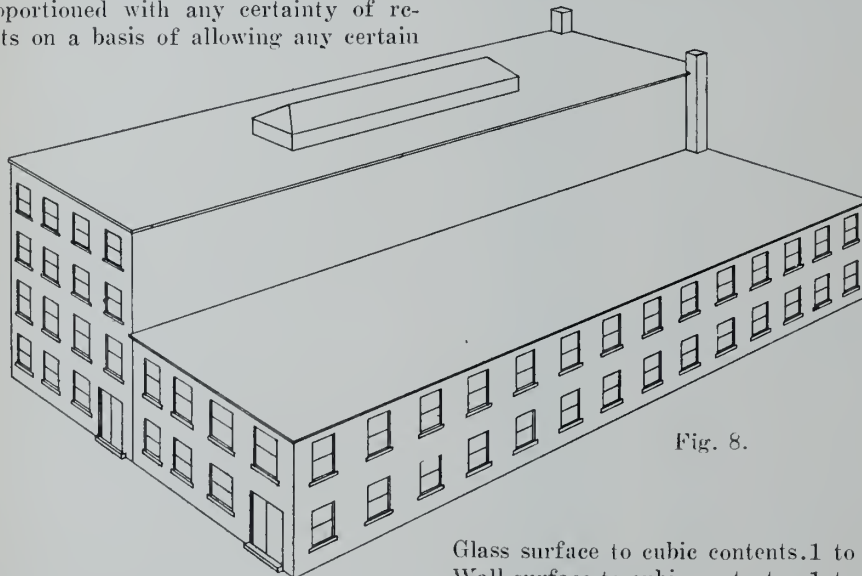


Fig. 8.

amount of heating surface to a given amount of cubic contents.

Satisfactory results can only be had where all the surrounding conditions, and necessary requirements are thoroughly considered and the required heating surfaces are proportioned according to the loss of heat from the building or the space under consideration. The greater the exposure and the higher the temperature required the greater will be the heating surface required to meet the heat loss.

Variation of Exposures.

The cubic contents may remain constant and yet the exposure may vary greatly in relation to the cubic contents.

As illustrating this we may take the case where the first floor above the ground floor of a building (see Fig. 8) is under consideration.

In this instance the floor is one of several in the same building that is to be heated. The space in question is

Glass surface to cubic contents. 1 to 117
Wall surface to cubic contents. 1 to 90

It is to be considered that the spaces above and below are to be heated to the same temperature as the space in question and that the buildings on each side are also heated.

The loss in B.T.U. per square foot of surface by reference to table A (see Plumber and Steamfitter, Feb. 12, 1908) and for one change of air per hour would be as follows:

Glass surface $256 \times 85 = 21760$
Wall surface $344 \times 23 = 7912$
Cu. contents $(30000 \div 55) \times 1 \times 70 = 38100$

Heat loss 67772
Add 20 per cent. for non-heating at night 13554
Add 25 per cent. of one exposure to west 3709

Total heat loss in B.T.U. 85035
 $85035 \div 250 = 340$ or 340 square feet as the amount of direct steam heating surface to give 70 degrees Fahrenheit with zero outside.

Conditions of Calculation.

The above calculation contemplates that the walls are 12-inch unplastered walls and the building is only to be heated during the day and that the space is not filled with goods or machinery to any great extent, also that the total heat emission from the radiation is 250 B.T.U. per hour per square foot of heating surface.

If the conditions were such that this same space was to be heated to 60 degrees (a very comfortable temperature for ordinary work) when the temperature outside was zero and the room was kept warm at all times, or if it was occupied with a large amount of goods and machinery, which would continue to give off heat after the air of the room had dropped to a lower temperature than that to which the goods and machinery had been raised, then our calculation would be made as follows:

Glass surface $256 \times 73 = 18688$
Wall surface $344 \times 20 = 6880$
Cu. contents $(30000 \div 55) \times 1 \times 60 = 32700$

Heat loss 58268
Add 25 per cent. one exposure to west 3196

Total heat loss in B.T.U. 61464
 $61464 \div 250 = 246$ or 246 square feet as the amount of direct steam heating surface that would be required to maintain 60 degrees in this space under the conditions given.

It will be noted here that the relation of the heating surface to the cubic contents in the first case is 1 to 90, and in the second case the relation is 1 to 126.

Exposed on Three Sides.

The calculations for the next floor above would be somewhat different. This floor is exposed on three sides—the front, the rear and one side wall. In the side wall there are no windows. The ceiling is 10 feet high.

In this case our calculations would be made as follows:

Glass surface $256 \times 85 = 21760$
Wall surface $1344 \times 23 = 29912$
Cu. contents $(30000 \div 55) \times 1 \times 70 = 38100$

Heat loss 89772
Add 20 per cent. for non-heating at night 17954
Add 25 per cent. of west and north exposure 9459
(West exposure = 128 square feet glass)
(West exposure = 172 square feet of wall)
(North exposure = 1000 square feet wall)

Total heat loss in B.T.U. 117185

$117185 \div 250 = 468$ square feet as the amount of direct steam heating surface to maintain 70 degrees Fahrenheit in this space with zero outside.

If this same space were to be heated to 60 degrees continuously when the thermometer outside stood at zero then our calculations would be made as follows:

Glass surface $256 \times 73 = 18688$
 Wall surface $1344 \times 20 = 26880$
 Cu. contents $(30000 \div 55) \times 1 \times 60 = 32700$

Heat loss 78268
 Add 25 per cent. of west and north exposure 8198

Total heat loss in B.T.U. 86466

$86466 \div 250 = 346$ square feet as the amount of direct steam heating surface in standard height radiation to maintain a temperature of 60 degrees with the outside temperature at zero.

For the heating of the top floor still further factors need to be considered as the roof presents further cooling surface and there is also a skylight which measures 30x8 feet. The skylight has a double pitch and is three feet high, and has glass at the side as well as for its roof. The total glass surface is 425 square feet.

Cooling Surface of Roof.

This floor is to be used for light manufacturing business and is only heated during the day and the space occupied by the contained goods and machinery is limited.

The roof or ceiling is 3-inch pine with a covering of the usual roofing materials and in cooling effect should be considered the equal of the wall surface per unit of surface. The height of the ceiling is 10 feet.

The side walls have no windows and it is to be assumed that one of the side walls adjoins another building of equal or greater height and that the side wall next to the two-storey building faces the north. The outside walls of this floor are also to be considered as being 12 inches thick and unplastered.

Our calculations for the heating surface would be made as follows:

Sq. feet.
 Glass surface (windows)
 $(4 \times 8 \text{ feet}) \times 8 = 256$
 Glass surface (skylight) 425

Total glass surface 681
 Wall surface (100x10 feet) 1000
 Wall surface (30x10 feet) $\times 2 = 600$

1600
 Less glass surface 256

Net wall surface 1344

Roof (100x30 feet) 3000
 Less skylight space (30x8 feet) 240

Net roof surface 2760
 Glass surface (windows) $256 \times 85 = 21760$
 Glass surface (skylight) $425 \times 85 = 36125$
 Wall surface (net) $1344 \times 23 = 30912$
 Wall surface (roof) $2760 \times 23 = 63460$
 Cu. contents $(30000 \div 55) \times 1 \times 70 = 38100$

Heat loss 190357
 Add 25 per cent. of north and west exposure 19032

Total heat loss B.T.U. 209389
 $209389 \div 250 = 837$ or 837 square feet as the required amount of radiation required for heating with steam when 70 degrees is to be maintained at zero outside.

To the above is to be added 20 per

Total glass surface $681 \div 2 = 340$
 Total wall surface $4104 \div 20 = 205$
 Total cubic contents ... $30000 \div 200 = 150$

Required square feet surface... 695

This rule gives 695 square feet as the required amount of surface without allowance for the north and west exposure which would add 60 feet more on the basis of this rule, making a total of 755 square feet as against 837 square feet calculated by the previous method to maintain a temperature of 70 degrees with zero outside.

The relation of the heating surface to the cubic contents according to the first method would be approximately 1 to 36 and by the second method 1 to 40.

If wall radiation is to be used instead of standard height radiators 25 per cent.

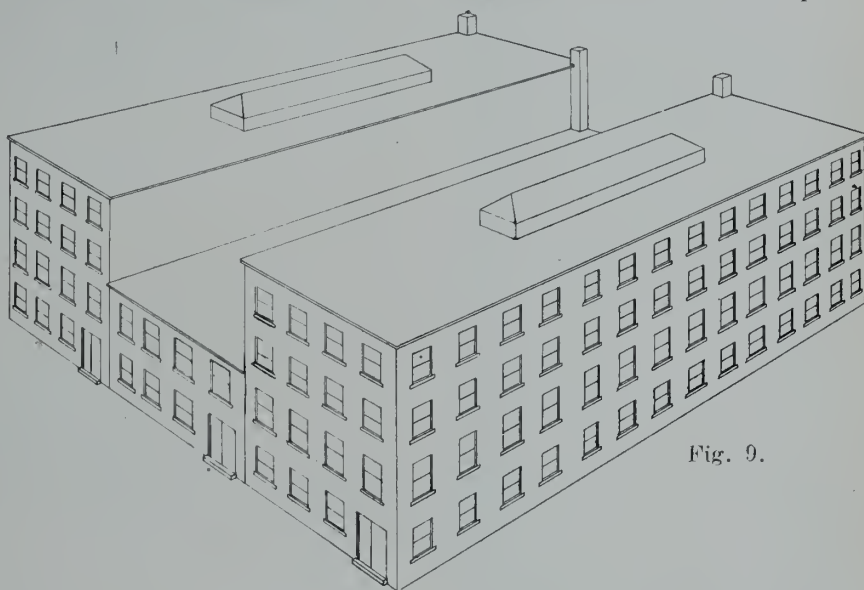


Fig. 9.

cent. or 1-5, equal to 167 square feet if heat is not continued during the night.

If 60 degrees was to be maintained at zero outside then the calculations would be made as follows:

Glass surface $256 \times 73 = 18688$
 Glass surface $425 \times 73 = 31025$
 Wall surface $1344 \times 20 = 26880$
 Wall surface $2760 \times 20 = 55200$
 Cu. contents $(30000 \div 55) \times 1 \times 60 = 32700$

164493

Add 25 per cent. of north and west exposure 16320

Total heat loss B.T.U. 180813
 $180813 \div 250 = 727$ or 727 square feet as the amount of radiation required to maintain 60 degrees with zero outside.

No allowance has been made here for heat from any other source than that from the radiation.

It might here be interesting to compare the 2-20-200 rule (Mills), in which the calculation would be made as follows:

may be deducted from any of the calculated amounts on account of the greater heat emission of wall radiation.

From this the schedule of the radiation for the entire four floors of this building would be made up as follows:

Sq. feet.
 Ground floor 340
 First floor 340
 Second floor 468
 Third floor 837

Total surface 1985

If the doors of the ground floor are opened frequently radiation will need be added to the amount for the ground floor according to frequency with which these doors are opened.

Fig. 9 shows two four-storey buildings with the two-storey in between. The four-storey building with windows in side walls would have three sides exposed for two of the floors and four sides for the upper two floors and these upper floors have windows on all sides. In calculating the required surface these additional exposures and the additional

glass surface would be necessarily considered in making up the schedule of radiation.

The radiation for the two-storey building as shown in Fig. 9 for the ground floor would be the same as in the preceding calculations for a floor space 30x100x10 feet when there is only two exposures, one at the front and one at the rear.

The upper floor has a 10-foot ceiling and the roof is of 3-inch pine, covered with the usual roofing materials but has no skylight. In determining the radiation required our calculations would be as follows:

Glass surface	256×85=21760
Wall surface	344×23= 7912
Roof surface	1000×23=23000
Cu. contents (30000÷55)×1×70=	38100

Heat loss	90772
Add 20 per cent. for non-heating at night	18154
Add 25 per cent. of one exposure to west	3709

Total heat loss in B.T.U.112635

$112635 \div 250 = 450$ or 450 square feet as the amount of direct steam heating surface that would be required to maintain 70 degrees in this space of 30,000

In determining the radiation for this building our calculations would be as follows:

Ground Floor.

Glass surface (4x8 feet)×36=	1152
Wall surface (100x10 feet)×2=	2000
Wall surface (30x10 feet)×2=	600

Gross wall surface	2600
Less glass surface	1152

Net wall surface1448

First Floor.

Glass surface (4x8 feet)×36=	1152
Wall surface 100x10 feet)×2=	2000
Wall surface (30x10 feet)×2=	600
Wall surface (roof) (100x30 feet)=	3000
Gross wall surface	5600
Less glass surface	1152

Net wall surface4448

In the above the doors have been considered the same as the windows to simplify the calculations, but if opened frequently they would need be allowed for further. The walls are 12-inch brick unplastered.

steam radiation to maintain 70 degrees at zero.

The total radiation for this building then would be made up as follows:

	Sq. feet.
Ground floor	742
First floor	1016
Total	1758

Wide Variations.

The above shows a variation between 810 square feet and 1758 square feet for the building. In one case the building being exposed only on the two ends and in the other case on all sides and with windows in the side walls. The 2—20—200 rule for the building would give the following results:

	Sq. feet.
First Floor	
Glass surface	$1152 \div 2 = 576$
Wall surface	$1448 \div 20 = 72$
Cubic contents	$30000 \div 200 = 150$

Radiation 798

Second Floor.

Glass surface	$1152 \div 2 = 576$
Wall surface	$4448 \div 20 = 222$
Cubic contents	$30000 \div 200 = 150$

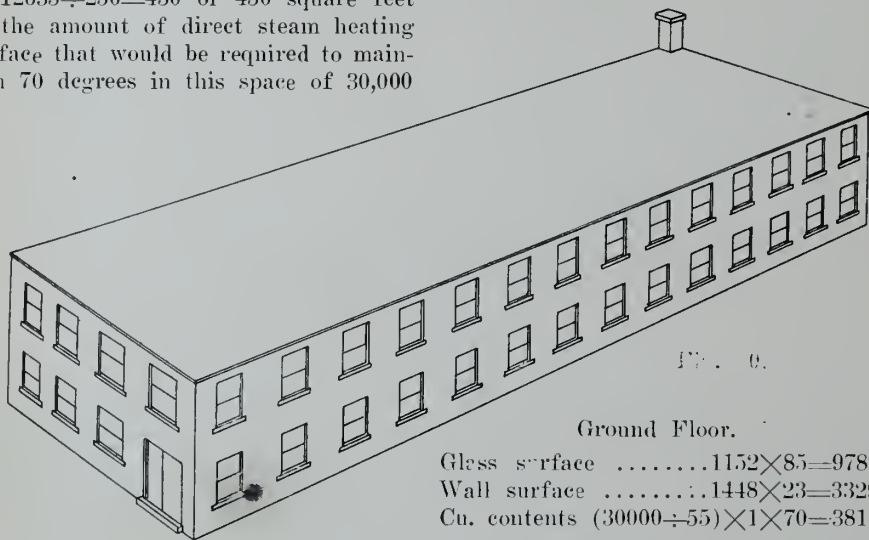
Radiation948

This gives a total surface required for the two floors of 1746 square feet. No allowance, however, here has been made for the exposure to the north and west. But this rule does not as closely take into consideration all the factors entering into the different cooling surfaces and consequent varying heat losses.

The change of air as has been noted heretofore is a variable amount depending upon varying conditions of construction and use. As will be noted in making these calculations one change per hour has been considered. If there would not be a change of but once every two hours then the multiplier would be 1-2 instead of 1 and if two changes per hour were to be considered then the multiplier would be 2.

If the ceiling was such that there was an air space between it and the roof proper and if the walls were thicker or if they were stripped and plastered then the heat losses would be considerably reduced and any calculations made accordingly. No allowance has been made here to cover the heat from other sources or from artificial lighting or the heat from any number of persons that may be occupying the space under consideration. If such are to be considered then the proper deductions should be made for heat from such sources.

These differing conditions have been given in the various tables in the preceding articles and may be used with reasonable certainty for conditions that vary from those that have been cited.



Ground Floor.

Glass surface	$1152 \times 85 = 97820$
Wall surface	$1448 \times 23 = 33294$
Cu. contents (30000÷55)×1×70=	38100

Heat loss	169214
Add 25 per cent. of north and west exposure	16390

$185504 \div 250 = 742$ or 742 square feet of direct standard height heating surface if this space is to be heated to 70 degrees at zero outside.

First Floor.

Glass surface	$1152 \times 85 = 97820$
Wall surface	$4448 \times 23 = 102294$
Cu. contents (30000÷55)×1×70=	38100

Add 25 per cent. of north and west exposure	16390
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$254604 \div 250 = 1016$ or 1016 square feet as the required surface in direct

cubic contents on the top floor where the building is surrounded on both side walls by building that are as high or higher than the building under consideration.

The schedule of the total radiation would be made up as follows:

	Sq. feet.
Ground floor	340
First floor	450
Total	810

Exposed on All Sides.

In Fig. 10 the two-storey building is shown standing free of all other buildings and consequently exposed on all sides.

The building measures 30x100 feet and has 10-foot ceilings on the two floors. There are a total of 70 windows and two doors.

An Ideal Twentieth Century Home

A House Without a Chimney Described by the Heating and Ventilating Magazine, New York.

The ideal twentieth-century home has just been completed at Carrollton, Ill. The house is constructed of concrete and there is no chimney, although the building is supplied with an abundance of artificial light and heat. Neither is there any fire in the house, or coal, or ashes or dangerous gases.

While this remarkable residence, built by F. M. Sinsabaugh, of the Carrollton Light, Heat & Power Company, is the first of its kind in the world, it is a good example of what the average American home may be in a few years from now.

Mr. Sinsabaugh's model house is two stories high, with attic and basement, and has eight rooms on the two main floors. The foundations and walls are of concrete blocks. The concrete was mixed on the site and moulded into the building blocks as required. There was no waste of building mate-



A Twentieth-Century House Built Without a Chimney.

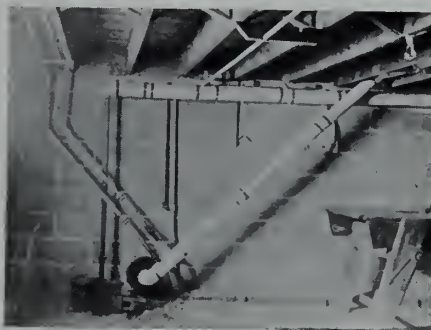
rial. The floors are of wood and the interior is finished in plaster and oak. The style of architecture is of the mission type. The mission idea is carried out in the interior decorations as well. The building is fronted by a porch of 8x32 feet and the house complete cost less than \$3,500.

The interior is roomy and comfortable. On the left of the entrance hall is the parlor, and on the right the library; back of the latter is the dining-room, connected by a pantry to the kitchen. The house is illuminated with electric lights. The chandeliers and lighting fixtures are of hard wood and stained glass.

This remarkable residence is heated by steam from a central station, the exhaust steam from a nearby electric light plant being carried to the house through underground pipes. The supply pipe enters the house in the base-

ment where it is connected to risers supplying steam radiators in the various rooms.

A special arrangement had to be



Cellar in Twentieth-Century House Showing System of Steam Heating From Central Station.

made to supply hot water for the bath room and for other purposes. Near the ceiling in the bath-room is located a water tank, the water in which is heated by steam pipe coils inside the tank. The tank supplies hot water for the bath and to the wash bowls located in two of the upstairs bedrooms. The house is also wired for electric heat in case of the shutting down of the steam heating system.

In the kitchen no steel range is visible. The principal article of furniture is what looks like an oak sideboard. This "sideboard" is an electric stove, designed by the General Electric Co. The back of the wooden cabinet is a small



Electric Kitchen in Twentieth-Century House.

switchboard and all the utensils arranged on the stove are connected to this switchboard with suitable wires and

plugs. A turn of the switch and the electric tea kettle is soon singing over an invisible source of heat. With the same ease the frying pan, cereal cooker, griddle, broiler, vegetable cookers, etc., are made ready to do their share of the work of preparing a meal.

Alongside the cabinet is placed an electric oven wherein the heat is so economized and concentrated as to more than equal the work of an ordinary cook stove oven. In the use of the electric stove, there is found to be no excessive heat in the kitchen, especially on ironing days, and of course



Hot Water Supply System in Twentieth-Century House.

the coal and ash question is entirely eliminated.

In fact, so easily are the meals cooked that the coffee, tea and toast are prepared on the dining-room table. The electric coffee percolator, at the turn of a switch, prepares the coffee while the cereal is being eaten and the toast is prepared at the same time. The cost of cooking the meals by electricity in this house is estimated at less than \$2.50 a month for a family of five persons.

By utilizing the waste steam from the electric light plant the cost of heating the house in cold weather is reduced to a minimum, while the room

that a heater and coal bin ordinarily occupy is used for other purposes. With special meter rates for electric heating the cost of cooking the various meals is no more than if coal or gas were used.

MUELLER CALKING TOOLS.

Do you remember when you were a boy how mad the dog got when you poked a stick through the picket? The dog knew what he could do to you if it were not for the fence, but he could not get at you. That's what worried him. You have been just about as mad when you tried to calk a soil pipe placed in a corner or some other unhandy place. You knew what you could do to the joint if it were not for the restricted space,



Mueller Combined Calking Tools.

but you could not get at it. That's what worried you. It's worried many a plumber in the same way.

It was these conditions that led a practical plumber to design and patent the Mueller Combined Calking Tool. These have solved a vexatious problem. A hammer and calking iron or hammer and yarning iron have been made into one tool with a handle bent to conform to the circumference of the pipe. No matter how small the space back of the pipe, so long as it is large enough to admit the tool, a joint may be rapidly and securely calked. The pipe acts as a guide and a good heavy blow may be struck. It is just as easy as calking a pipe when all sides are exposed. These tools are made entirely of steel or of steel with wood handles.

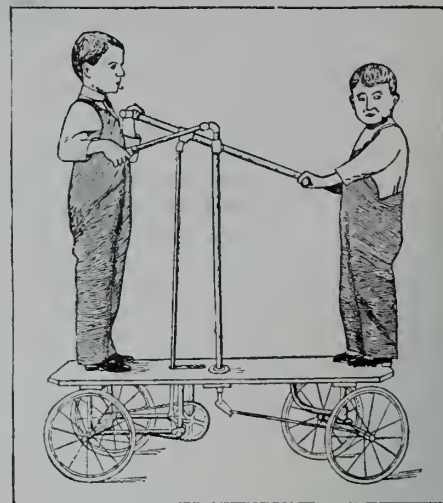
CREDIT TO ENGINEERING REVIEW

The article on pages 12 and 13 of Plumber and Steamfitter, April 22, credited to the Bulletin of the U.S. Bureau of Labor, should have been credited to the Engineering Review, New York, only two of the engravings originating with the Bulletin, the remainder of the article being prepared by the Engineering Review. The latter paper has been greatly improved in recent months and is now recognized as an authority on both plumbing and heating subjects.

STEAM HEATING IN ROME.

The inauguration of the Canadian College at Rome, Italy, some twenty years ago, marked an epoch of comfort in

bicycle, which was also drawn upon for the cork handle used on the steering lever. The floor is made of 1-in. white



Hand Car Made of Pipe and Fittings.

pine, 14 ins. wide and 48 ins. long, to which are bolted ordinary flanges to hold the framing and the propelling and steering apparatus together. The axles were made from $\frac{3}{8}$ -in. shafting. The fifth wheel consists of two small flanges working on the face surfaces. These flanges and the auxiliary steering rod are connected to the axles by means of holes stamped in the piece of sheet iron which encases the axle. The sheet iron was first properly stamped and then bent around the axle. The levers for propelling and steering the car work in fulcrums made for use in lever valves. The turned wooden handles by which these levers are operated were inserted through holes drilled in the connecting tees. The working joint for the steering and hand levers consists of a $\frac{1}{2} \times \frac{3}{8} \times \frac{3}{8}$ in. tee, a $\frac{1}{2} \times \frac{3}{8}$ in. cross and a piece of rod threaded on both ends and screwed into the tee. The cross is reamed and, with the rod, forms a bearing.

The operation of this hand car is very similar in principle to that of the ordinary tricycle, says Domestic Engineering. The machine can be propelled as fast as a boy can run. It responds readily to the slightest movement of the steering lever.

HAND CAR MADE OF PIPE AND FITTINGS.

Although apparently complicated, the construction of the miniature hand car shown in the accompanying illustration is very simple. With a few exceptions all the parts are short lengths of pipe and common tees, elbows and nipples.

The wheels were manufactured for use on a baby carriage. The sprocket wheel and chain were taken from a discarded

MORE IMPORTANT THAN MILK.

"Sanitary plumbing in private residences," says Mr. Clayton, business agent of the Montreal Journeymen Plumbers' Union, "is more important than the milk question. While the infants are the only sufferers by adulterated milk, the whole family's health is always endangered in places where the plumbing has not been done according to hygienic and scientific principles."

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

PUBLISH PLUMBING REGULATIONS.

Editor Plumber and Steamfitter: Sir,—I welcomed the advent of your journal, knowing that the want existed and that it's success would be permanent and profitable, while conducted along impartial lines, always upholding good work, and condemning the evils of poor work done through ignorance, which not only injures the person doing it, but also reflects discredit on the trade as a whole.

I consider that one of the most important items discussed in the journal was the house trap problem, to which I have already contributed, and I would suggest that you publish copies of the plumbing regulations of the different cities in Canada, also of the United States and Great Britain, after which a general discussion on that most important problem can be profitably carried on, which could be participated in by our American experts if you could get their opinions.

There are also several other problems that I would like to see discussed, but not having much time at my disposal, for that purpose, I trust that others will suggest the subjects.

"HYDROSTATIC."

Halifax, N.S., April 30.

TRADE EVILS DOWN EAST.

Editor Plumber and Steamfitter: Sir,—I am very much pleased with your paper. It's a very valuable magazine and well digested would be a great assistance to practical men.

I was glad to notice in your last issue the stand you have taken as to the importance of sanitary plumbing. Few people, especially in the Lower Provinces, are educated up to this vital question.

There are two evils confronting the Master Plumbers of the Provinces: (1) Jobbers selling outside of the trade. This is a great hinderance to the trade, and it's being practised here in the towns and villages every week in the year. (2) The number of would-be plumbers working at journeymen work without licenses. For illustration, I hired a plumber and gave him \$2.50 per day for 8 hours, but I had to compete with Master Plumbers who were getting their men for \$1.40 per day for 10 hours.

My competitors' jobs looked fine. The

customer would say: "Why he puts up a fine looking job," not being conscious of the fact that they were only looking at the fixtures. Why the best looking job I ever saw in my life was in a Master Plumber's show room without a trap or back vent.

I think that every town of 5,000 or over should have an examining board to examine all journeymen. This method will insure good work and better protection.

JAMES C. CARTER.

Sackville, N.B., April 28.

WOULD LIKELY INJURE PUMP.

Editor Plumber and Steamfitter: Sir,—We are thinking of installing a bath in the basement for the use of the employes in the store. We can arrange everything without any trouble, but we do not know how to dispose of the waste. Now we have considerable soakage water in the basement which runs in a well for the purpose and we pump it out with a windmill. Would this water cause any trouble with the pump or ordinary galv. pipes if we allowed the water from the bath to run into the well? We use 1½-in. galv. pipes, and the windmill is, say, one hundred feet away.

R. D. McNAUGHTON CO., LTD.

Moosomin, Sask., May 12.

Note.—The soap and grease from the bathtub would be very likely to injure the pump, clogging it and thus preventing the proposed system from working properly. Has any reader had any experience with such a system?—Editor.

CANNOT BE TOO SEVERE.

Editor Plumber and Steamfitter: Sir,—I prize your paper very highly and have derived much valuable information from it, and would advocate very strongly a thoroughly Canadian paper. The Plumber and Steamfitter cannot be too severe in the criticism of incomplete inspection and poor workmanship.

A. E. CONSTABLE.

Prescott, Ont., May 8.

DON'T USE BIG WORDS.

Editor Plumber and Steamfitter: Sir,—Congratulations on the success of your paper. Have read it with pleasure and profit. Every architect and plumber

in the country should be a subscriber. The article in the March 25 number on Radiating Surfaces was particularly good. Avoid as much as possible the use of algebraic formulae and high sounding scientific terms. The average plumber is not college educated, and while he thoroughly understands what he wishes to accomplish, and what he reads when expressed in ordinary language, the big words and complicated figures scare him. Keep on in the good work.

J. W. HUGHES.

Montreal, April 25.

HONEST DEALINGS IN BUSINESS.

Editor Plumber and Steamfitter: Sir,—What we want in this Canada of ours are more papers that stand forth for good, pure and honest dealings in business, and as we are interested in the plumbing and steamfitting trade we ask especially that it be done in ours.

You ask that any one desiring to suggest points may do so. Permit me to state that if a page of your paper be given to instilling into the minds of mechanic and apprentice the necessity and essentials of doing good, honest and faithful work, then we would, I believe, secure good results.

Business getting is not so much to be desired as business building, and if we can show to the men that they are in reality part and parcel of the institution, in my opinion, it would be productive of much good, to both the mechanic and institution, for we are not independent one of the other.

NOBLE & RICH.

London, April 29.

WANTS MORE DISCUSSION.

Editor Plumber and Steamfitter: Sir,—The articles on "Radiating Surfaces" and "Septic Tanks" were very good, and I would be pleased to see more discussions on trade questions, which would benefit all.

OSCAR WIELER.

Huntsville, May 6.

INTERESTING AND PROFITABLE.

Editor Plumber and Steamfitter: Sir,—We have pleasure in saying that we find Plumber and Steamfitter both interesting and profitable. We have no suggestions to offer, as we feel that you understand your business better than we can teach it to you. Your advocacy of good honest work, at a fair, honest price, has our hearty approval.

PHILLIPS & CO.

Orillia, May 5.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

Meaford, Ont., will erect a \$15,000 town hall.

A \$5,000 school will be erected in Sparta, Ont.

A new post office may be erected in Waterloo, Ont.

A Carnegie library will be built at Pembroke, Ont.

Hamilton, Ont., will erect a \$55,000 technical school.

A new Anglican church is being erected in Hastings, Ont.

Six new post offices will be erected in Peterboro Township.

A new Catholic church will likely be erected in Calgary, Alta.

Tenders are called for a \$90,000 school building at Lethbridge, Alta.

A \$16,000 school building is proposed to be erected in Dundas, Ont.

Oakville, Ont., carried a by-law to erect a \$26,000 High school.

The Supreme Court building, Halifax, N.S., will have a \$25,000 addition.

Zion Lutheran church Stratford, will erect a new edifice early this summer.

Prince Albert, Sask., passed a by-law to spend \$90,000 for a new High school.

It is proposed to enlarge Montreal's city hall by the addition of two storeys.

Verdun, Que., will erect a \$40,000 town hall, fire and police station building.

A new observatory building will be put up by Queen's University, Kingston, Ont.

A \$21,000 German Lutheran church and parsonage will be built at Montreal.

Guelph water commissioners will erect a new pump house and a new concrete standpipe.

The New eight-room school to be erected at Owen Sound, Ont., will be heated by steam.

The Lethbridge, Alta., school board is calling for tenders for a \$90,000 school building.

The contract has been let for building the new \$125,000 Church of England cathedral, Halifax, N.S.

Calgary, Alta., will build a public library. Andrew Carnegie has donated \$50,000 for this purpose.

A new filtration plant building will be erected in connection with Stratford's (Ont.) waterworks system.

Montreal's Technical School Commission has purchased a site for the erection of the \$350,000 school building.

Faulkner & McDonald, Sydney, C.B., have the contract for the new \$110,000 technical college to be built in Halifax, N.S.

The Minister of Militia announces that the Government will erect a number of armory buildings in the smaller towns of Canada.

Moose Jaw, Sask., ratepayers will on May 26, vote on a by-law authorizing the expenditure of \$110,000 on a Collegiate Institute.

Saskatoon, Sask., has carried by-laws providing for a \$55,000 municipal hospital, a \$25,000 fire hall and equipment, and a \$20,000 new C.P.R. bridge.

St. John's Anglican congregation, Moose Jaw, Sask., will erect a new church in the near future and a \$10,000 parish hall during the summer.

Winnipeg, Man., will submit by-laws asking for \$100,000 for an isolation hospital, \$15,000 for a morgue, and

\$125,000 for additional hospital purposes.

The following public buildings are under construction in Calgary, Alta.: Government registry office, \$90,000; new Normal school, \$200,000, and the new city hall.

Public buildings at present being erected in Edmonton, Alta., are the Provincial Parliament buildings, \$1,250,000; the city incinerator and the city power house.

Edmonton, Alta., during April issued permits for a new fire hall, \$26,250; new Normal school, \$56,000, and new power house and laundry for general hospital, \$40,000.

Tenders have been asked by the Public Works Department, Toronto, for the construction of an administration building, a residence for the superintendent, and two cottages at Jordan Harbor.

Chas. F. Wagner, Toronto, has prepared plans for the erection of a \$10,000 Lutheran Church at College and Markham Sts., that city, and for a \$15,000 Baptist Church at Balmy Beach (Toronto).

New schools are being erected this year at East Toronto, Niagara Falls (two public and one collegiate), St. Catharines (two new and two alterations), Welland, Paris, Waterloo, Oakville and Hamilton (two). In most of these buildings the Standard Ideal Co.'s enamelware, range closets, etc., have been specified.

Smith Bros. & Wilson, Regina, have been awarded the contract for the new courthouse at Moose Jaw, and Carter, Halls & Aldinger have the contract for the new jail at Moosomin. This latter firm will also erect Hon. Robt. Rogers' \$15,000 residence at Winnipeg.

The Manitoba Government will shortly call for tenders for the erection of a big reformatory or training school at Portage la Prairie; a power house for same institution; a residence for superintendent of Home for Incurables at Portage, and a big machinery hall at the Agricultural College.

General Building Notes.

G. A. Walton, Toronto, will erect a \$12,500 dwelling.

Montreal's building permits for April totalled \$267,065.

Winnipeg's Y.W.C.A. propose to erect a \$75,000 building.

A \$250,000 apartment house will be erected in Toronto.

The Imperial Bank will erect a new building in Welland, Ont.

Edmonton's (Alta.) building permits for April amounted to \$197,255.

The building permits issued in Toronto for April totalled \$1,169,635.

Building permits in Toronto for the first ten days of May total \$171,000.

Senator Lougheed will build a three or four-storey block in Calgary, Alta.

Vancouver's (B.C.) building permits, totalling \$1,500,000, is a record-breaker.

Mrs. H. B. Peterson, Winnipeg, will erect a \$12,000 residential flat building.

A \$15,000 gymnasium building is proposed to be erected by the Toronto Y. W.C.G.

The new observatory building at Queen's University, Kingston, Ont., will cost \$2,500.

Since the beginning of the year fifty

building permits have been taken out in Peterboro.

The Metropolitan Bank will erect a \$10,000 branch bank building in the east end of Toronto.

The Imperial Trust Co., Vancouver, B.C., will erect a thirteen-storey structure costing \$400,000.

Manager Johnson will erect a new \$25,000 theatre in Brantford, to replace the one recently burned.

Tenders will shortly be called for the erection of the \$45,000 "Men's Own" club building, Winnipeg.

Edmonton, Alta., has at present under construction the Blowey-Henry block, \$60,000, and the Swift packing plant, \$250,000.

A \$40,000 extension is to be made to the Halifax Hotel; and \$30,000 will be spent on enlarging the Queen's Hotel, both at Halifax, N.S.

F. T. Ranney, Detroit, and R. Loveland, Sandwich, Ont., propose erecting a \$500,000 pulp mill at Sandwich, if the duty on pulpwood entering the States is removed by Congress.

Fort William's building this year will mean the expenditure of about \$3,000,000. The G.T.P. is putting up a \$1,000,000 elevator, and the C.P.R. a \$500,000 one. Two churches, two schools, a fire hall and improvements to the hospital means \$220,000 more, and industrial structures will bring the total up to the \$3,000,000 mark.

Water and Sewage Systems.

Brantford's (Ont.) waterworks system will be extended.

A sewerage system will be constructed in Kitsalano, B.C.

Markdale, Ont., will spend \$20,000 on a waterworks system.

Hirsch, Sask., will spend \$75,000 on waterworks extensions.

Chilliwack, B.C., will raise \$17,000 for drainage and sewer extensions.

Finch, Ont., has passed a by-law to spend \$4,600 on sewer construction.

Lunenburg, N.S., will spend \$25,000 on waterworks and sewerage systems.

London, Ont., is considering a by-law to spend \$560,000 for waterworks purposes.

Sherbrooke, Que., is now ready to go ahead with the proposed sewerage extensions.

Indian Head, Sask., passed a by-law to extend waterworks system at a cost of \$10,000.

Port Stanley citizens will vote on a \$15,000 waterworks system within a month's time.

Saskatoon, Sask., will spend \$130,000 on extensions to its waterworks and sewerage systems.

The Montreal Waterworks Department has asked for \$500,000 for new works during the summer.

Portage la Prairie, Man., ratepayers carried a by-law to spend \$50,000 on an auxiliary waterworks system.

Moose Jaw, Sask., proposes to submit a by-law to raise money to extend its waterworks and sewerage systems.

The Victoria, B.C., waterworks department is asking for tenders for the supply of 70 tons of pig lead and for certain gate valves.

Regina, Sask., are to-day, May 20, voting on by-laws authorizing the city to spend \$90,000 on waterworks system extensions, and \$70,000 on sewerage system extensions.

Calgary, Alta., will spend \$175,000 on waterworks extensions; \$44,000 on the

completion of trunk sewers, etc.; and \$11,000 for the construction and equipment of a refuse destructor.

REGINA WILL BE BUSY.

The most important of all the structures projected for this year in Regina are the new Parliament Buildings, which will be erected by the Government of the Province of Saskatchewan. The plans of E. & W. S. Maxwell, Montreal, were accepted, although the leading architects of Canada, the United States and Great Britain competed for the prize. The buildings are to cost \$1,250,000, but the contractors figure that \$2,000,000 will be nearer the mark.

Work has already commenced on the buildings, which will front on Wascana Lake, the C.P.R. having put in a three-mile spur to transport material from the main line. The work will engage hundreds of men throughout the summer.

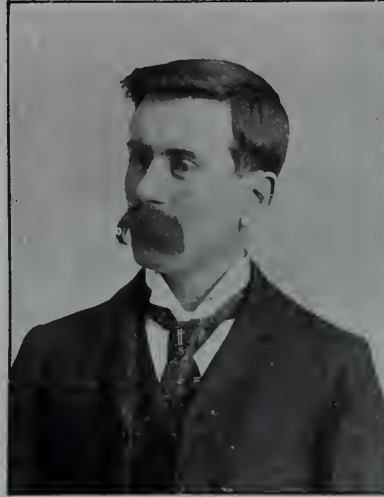
A number of other buildings are to go up this year in Regina. They are: Collegiate Institute (\$110,000); Separate School (\$60,000); Municipal Hospital (\$100,000); several large business blocks, and scores of residences.

A SUCCESSFUL PLUMBER.

E. S. Coppins, for seventeen years a prominent plumber, steam and gas fitter and electrician, of Woodstock, Ont., has moved his business to new and larger premises purchased by him on Dundas street. The removal was rendered necessary by the growth of his business.

In the new store a concrete-floored cellar gives ample storage and workroom; the first floor being devoted to showroom purposes, with workroom in

future in the above lines. The Heating Company, will, of course, continue the installation of hot air furnaces in Toronto.



E. S. COPPINS, WOODSTOCK.

the rear. On the second floor the electric and gas fixtures are displayed.

PEASE COMPANY MAKES CHANGE

The Pease Foundry Company, Toronto, have decided to sell hot water and steam goods exclusively to the steamfitting trade in future. The Pease Heating Company, a subsidiary concern, has been undertaking the installation of these lines in Toronto and district, but a change in policy was recently decided upon and only a jobbing and manufacturing business will be done

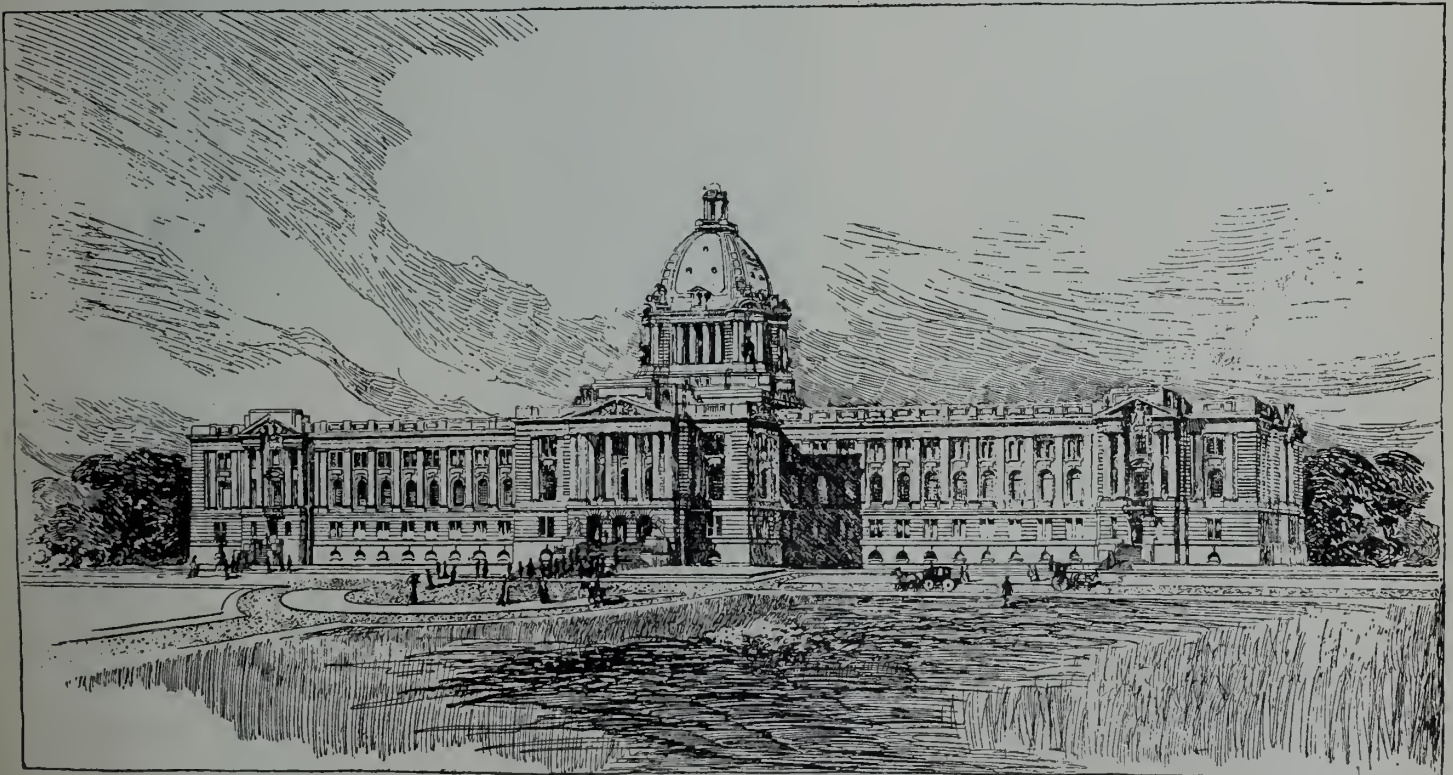
TORONTO PLUMBERS' STRIKE OVER.

The Toronto plumbers' and steamfitters' strike, which lasted almost a year, was settled on May 8. An agreement was come to with the recently organized Master Plumbers' Association, after a vain effort to reach an understanding with the master plumbers affiliated with the Employers' Association. The men are to receive 37½ cents an hour for the first year, and 10 cents an hour during the second year. The closed shop will be recognized only by the smaller shops.

While the working plumbers claim that the strike is closed, the big shops connected with the Employers' Association maintain that the situation is unchanged so far as they are concerned. The men, however, can go to work for employers who are prepared to pay the schedule of wages agreed upon with the new organization.

The plumbers who went on strike a year ago demanded 45 cents an hour and the closed shop. The strike has cost the union about \$75,000.

T. C. Jackson, formerly of Prescott, Ont., salesman for Haverstick & Co., plumbers and steamfitters, Rochester, N.Y., has been visiting his old home, having just resigned a position as traveler for Case & Co., of Buffalo. His many Ontario friends wish him success in his new position.



SASKATCHEWAN'S NEW PARLIAMENT BUILDINGS

Which will be erected this summer at Regina. It is expected the handsome structure will cost about \$2,000,000 before completion. The exterior is a fine adaptation of English Renaissance work. The stately edifice will be of red brick and pale buff stone which blend particularly well.

NEWS OF THE TRADE IN CANADA

Hotte & Lemieux, plumbers, Montreal, have been registered.

Lefrancois & Frere, plumbers, of Montreal, have been registered.

The Wm. Head Plumbing and Heating Co., Calgary, has opened a branch in Lethbridge, Alta.

The Dominion Heating and Ventilating Co., Hespeler, Ont., have begun to manufacture fire escapes.

Lockhart & Co., Galt, Ont., installed some elaborate plumbing fixtures in the new F. D. Palmer residence.

D. J. Shea, plumber and tinsmith, of Fredericton, N.B., has moved into a new and larger establishment.

Mahoney Bros., Guelph, Ont., are overhauling the plumbing and heating system in the Wellington hotel.

The creditors of the Kelly Plumbing, Heating & Lighting Company, Regina, Sask., are asked to file claims by June 1st.

The Vernon Hardware Co., Vernon, B. C., has the contract for heating the new hospital at Vernon, at a cost of \$14,202.

M. J. Quinn, heating engineer, with Cluff Bros., Toronto left on May 15 for a two weeks' business trip to Winnipeg and the west.

The Parkin Elevator Co. has taken over the Dominion Heating and Ventilating Co.'s plant in Hespeler, Ont. add News of Trade

The C.P.R. shops and round house at Moose Jaw, Sask., have been equipped with a modern steam heating system in place of the old hot air one.

Bernhardt & Gies, Preston, Ont., have the contract for the sanitary plumbing of the new Galt, Preston and Hespeler depot, Hespeler, Ont.

The new Y.M.C.A. building, Sherbrooke, Que., cost \$35,000, and has 40 bedrooms with hot and cold water in each. The building is heated by steam.

Harry Mahoney, Guelph, Ont., has been digging worms and preserving them in a fine brand of Irish in preparation for a trout fishing expedition on May 24.

A company is being organized in London, Ont., to pipe natural gas from Port Dover, Ont., to London, Woodstock, St. Thomas and neighboring places.

The Page-Hersey Iron and Tube Co., Guelph, Ont., have started on full time again. Night and day shifts are engaged. It is hoped to maintain this all summer.

Wm. Robinson, who has been managing A. T. State & Co.'s Sherbrooke, Que., branch, has been removed to the Montreal shop of the firm, where he will occupy the position of foreman.

The Smith Plumbing Co., London, have secured the contract for a low-pressure steam Pease heating and ventilating system to be installed in the Lorne Avenue school, in that city.

The American Radiator Company's Canadian branch factory in Brantford, Ont., resumed operations last week, after being closed all winter and spring. A new manager will be appointed, Mr. Harley having resigned.

Jos. A. Lockerby, Edmonton, has secured the contract for the installation

of the Pease Waldon system of steam heating and ventilating in the new Norwood school in that city. This is to be one of the largest schools in Western Canada.

The Regina Plumbing & Heating Co. have secured the contracts for the new provincial gaol at Moosomin, and the new post office at Medicine Hat. Prospects for the coming season were reported very bright by W. W. Abbott, manager of the company.

Frederick Smith, plumber, Guelph, Ont., has the heating and plumbing for the Elliott Home addition. He has also a heating contract in Acton, and the heating and plumbing contract for the renovated Traders Bank offices.

Friction Heat-Light Co., Ltd., has been incorporated, with head office at Toronto; capital, \$60,000; to manufacture boilers, heaters, furnaces, lamps, etc. Provisional directors, Geo. Paton, Jas. Linton, Alex. Laidlaw, Andrew Reading and W. M. Hall.

PLUMBERS SHOOT STRAIGHT.

Through the courtesy of L. L. Anthes of the Toronto Foundry Co., who returned from a few weeks' visit to Win-

CRANE CO.'S NEW BRANCH.

The Crane Co. Chicago, Ill., has purchased the steamfitting and plumbing supplies department of Boyd, Burns & Co., Vancouver, B.C. This makes the twenty-eighth branch of this large American manufacturing concern of valves, steamfittings, etc., and the second Canadian branch of the Crane Co., the other Canadian house being Crane & Ordway, located at Winnipeg.

R. T. Crane, the head of the company, personally conducted the deal, which includes the purchase of the large building at the corner of Water and Carroll Sts. The establishment of a branch in Vancouver indicates that the Crane Co. see much Canadian business to get, making it worth while to be directly represented on the ground.

WINNIPEG BUILDERS' SHOW.

Under the auspices of the Winnipeg Builders' Exchange an exhibition of builders' materials will be conducted in the Auditorium rink, Winnipeg, July 23 to 31. The growth of Winnipeg has been so phenomenal and the sale of builders' supplies has been so large that it is surprising that an exhibition of this kind did not several years ago establish itself as an annual event.



Winnipeg Plumbers Secure a Good Bag of Ducks.

nipeg a fortnight ago, we reproduce on this page a picture of Alex. Irving, of the Standard Plumbing and Heating Co., Winnipeg; Dan Gannon, traveler for the Canadian Brass Co., Galt, and Alex. Green, of Green & Litster, Winnipeg, after a successful morning's shooting of wild ducks 10 miles south of Winnipeg, Mr. Anthes being one of the shooting party.

Mr. Anthes reports business prospects in the west to be steadily brightening and the trading feeling optimistic. He is planning a combined business and pleasure trip to Port Arthur and Fort William this month, and as he is as good a shot with a camera as he is with a gun, we are promised some good fishing scenes (and maybe stories) in future issues.

A strong committee is in charge of the exhibition, a committee that assures the success of the enterprise. J. W. Morley is chairman, and W. Alsip, of the Alsip Brick, Tile and Lumber Co., is vice-chairman. These gentlemen are supported by E. Cass, T. D. Robinson, F. Powell, Thos. Black, T. R. Deacon, J. A. Payne, J. Bourgeault, G. W. Murray, W. Garson, A. T. Davidson and D. Cameron.

BRASS COMPANY ASSIGNS.

The Canadian Brass Manufacturing Company, Galt, has assigned to the London & Western Trusts Company, and a meeting of the creditors will be held at Galt on May 23.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, May 19.—Trade continues to improve, and although the total amount moving might be better, it certainly could, as one jobber cheerfully remarked, be very much worse. But whatever comparison may be drawn from last year, and comparisons of this description are not really fair, there is no disputing the fact that trade is improving, and improving in no half hearted way, and when this is so, there is no cause for complaint. Orders, as is the same in other industries, are somewhat lacking in bulk, showing that the trade is still reluctant to book too far ahead. The uncertainty that has existed as to building operations largely accounts for this. As time goes on, however, it becomes more and more evident that builders will be uniformly busy before many weeks are out, and when the builder is busy so is the plumber.

The trouble between the Bricklayers' Union and the Builders' Exchange has happily been shorn of much of the seriousness that was apparent at first. A bitter deadlock seemed at one time almost certain, and a complete tie-up of building operations was threatened. But the contractors in most cases have given way, and at present there is little interference with building operations. The plumbing trade, generally, is greatly relieved that things should have turned out so well.

Some fair-sized plumbing contracts have been secured, and others are shortly to be tendered. While there is a falling off in the larger jobs, there are plenty of residential houses going up, making the plumbing trade busy. Repair work, too, is not at all slack, and taking everything into consideration there is very little cause for complaint. Prices are fairly firm with the exception of lead pipe, and manufacturers are looking forward to a good season. Stocks are well assorted, and there is little possibility of any delay in shipment for some time. There is much more confidence all the way round than there was, and the season has opened out with better promise than many imagined would be the case.

Iron Pipe—Orders are much heavier than they were. Some fair-sized shipments have moved out, and inquiries show that much more activity is appearing in the trade. We continue to quote $\frac{1}{4}$ and $\frac{3}{8}$ pipe at \$2.03 and \$2.25 for black, and \$2.86 and \$3.08 for galvanized.

Soil Pipe—This article is moving in better bulk, and is commencing to feel the start of the building operations. Good orders were booked last week, and a heavy call is likely to spring up as users' stocks are on the light side. We quote: Light, 3 to 6 inch, 60 off; medium and heavy, 2 to 6 inch, 70 off; 8 inch, heavy, 40 off.

Lead Pipe—A steady demand has set in for lead pipe, and good trade is opening up. The reduction in price has tended to increase trade, and inquiries seem to point to heavier business shortly. We quote pipe and waste at 30 per cent.

Solder—Solder is still on the light side, but with the repair work going on and the extensive roofing operations, stocks must be rapidly becoming short. Probably the demand will look up again before the month is out. Fair shipments

have been made, however, at prices that are unchanged from last issue.

Enamelware—The call for bath tubs, etc., has improved splendidly, and orders are assuming good bulk. Manufacturers are much more busy, and anticipate a good season from now on. Prices are unchanged.

Brass Goods—The demand does not improve, comparatively, as well as other lines, but there is a better call. Manufacturers are, if anything, increasing production, which is a sign of better times. Some fair sized orders have been booked.

Radiators and Boilers—Some encouraging orders have been received, and a decided stimulation in trade seems to be setting in. Prices are unchanged. Steamfittings are showing more strength.

Metal—The chief feature in the metal market has been the fall in tin in the primary markets. The demand is still on the light side, but showing signs of improving. We quote: Ingot copper, 14c; ingot tin, \$33.50; lead, \$3.80; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10 $\frac{1}{2}$ c; light copper, 10c; heavy lead, 2 $\frac{1}{2}$ c.

TORONTO.

Toronto, May 19.—A more hopeful and promising outlook for the trade seems assured this week, and now that the local strike, which has been a disturbing element for a year, has been eliminated, a more buoyant spirit exists on all sides. An amicable settlement has been reached between the union and the smaller employers, the minimum wage to continue at 37 $\frac{1}{2}$ cents per hour, with an increase to 40c per hour next year. The larger shops will continue to be conducted on the open shop basis. One result of the year's strike is a material increase in the number of registered master plumbers many of the strikers having gone into business on their own account.

Building permits are increasing and some roughing-in work is already being done, on buildings now showing above ground. The promise of good times later in the season is more than fair. Prices remain unchanged. A fair demand exists for all lines of goods and many inquiries are being received by the larger supply houses.

Iron Pipe—Stocks are fairly plentiful and orders, though small, are fairly numerous. Prices remain unchanged compared with two weeks ago. One-inch galvanized is still quoted at \$6.93, with one-inch black at \$5.28. Cast iron fittings are still at 65 per cent., and the discount on malleable fittings remains at 35 per cent.

Soil Pipe—Prospects are bright and a little more soil pipe is moving than was reported a fortnight ago. Light pipe is unchanged at 60, and fittings at 70 per cent. Medium and extra heavy pipe and fittings are still at 70 per cent.

Lead Pipe—Orders continue fair, but there seems to be a slight hesitancy in sending in large orders. Pipe and waste are still at 30 per cent., and caulking lead remains at 4 $\frac{1}{2}$ per cent.

Solder—For wiping solder 18c is still asked and 19c is the quoted price for half-and-half.

Brass Goods—Business is normal, with prices unchanged. Compression work is at 65 per cent., while fuller work is yet at 70 per cent.

Enamelware—A fair trade is being done. Evidently the many inquiries received by some of the supply houses have led to sales. Prices unchanged.

Boilers and Radiators—Shippers are busier than usual at this season, most orders being for immediate delivery. Prices continue firm and unchanged.

Elford & Cornish, plumbers, Saskatoon, Sask., have fitted up the front of their premises as a showroom.

At the office of the James Morrison Brass Manufacturing Company, Toronto, a fortnight ago, on the occasion of Hugh Jackson severing his connection with the firm, after twenty years' services, he was presented with a gold watch by his fellow employees.

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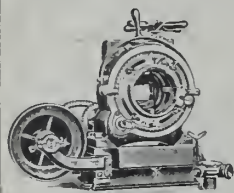
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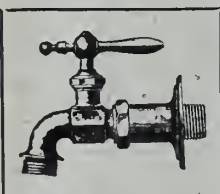
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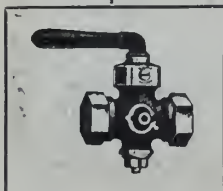
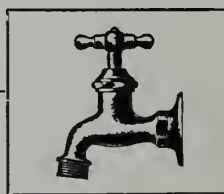
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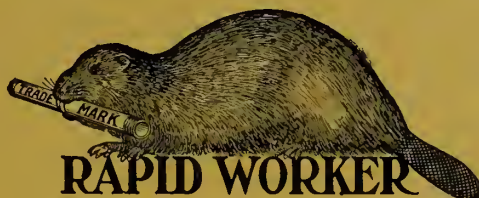
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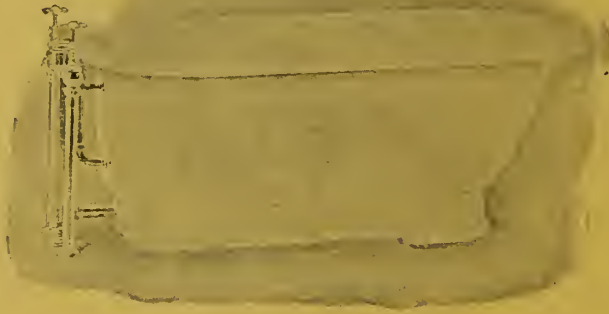
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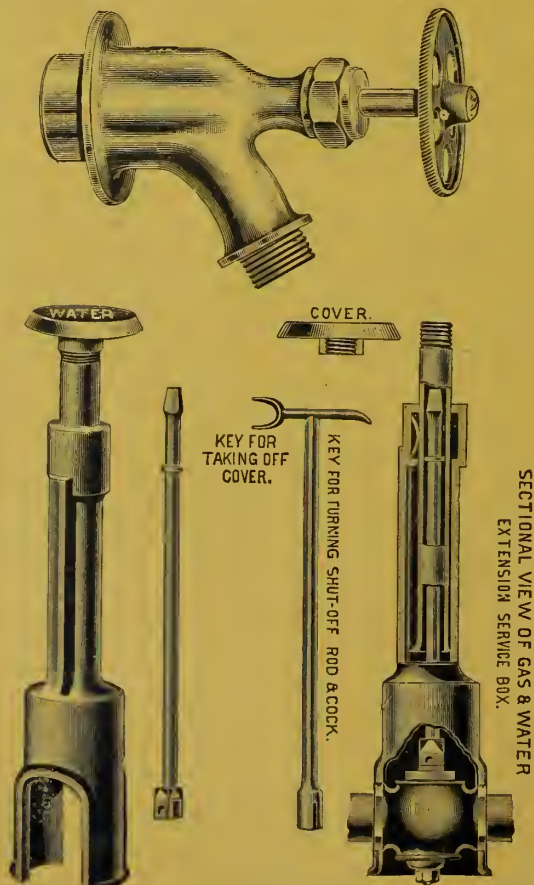
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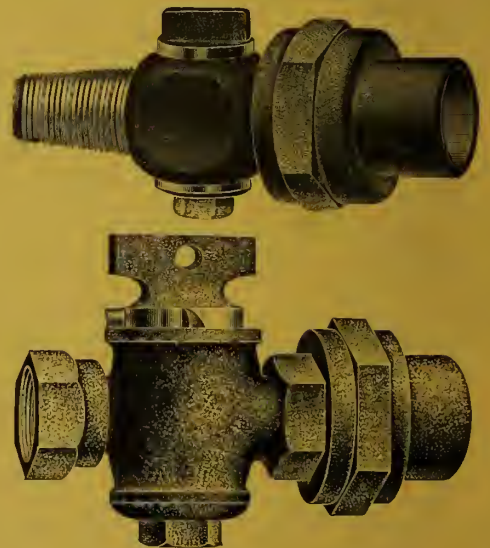
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Vol. II. No. 11. (New Series).

Publication Office: 10 Front St. East, TORONTO, JUNE 1, 1908.

Old Series, Vol. XX. No. 11

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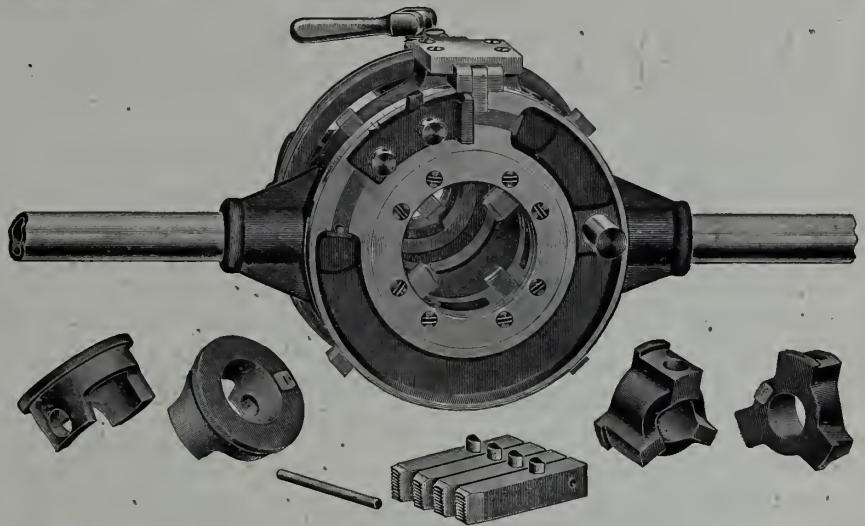
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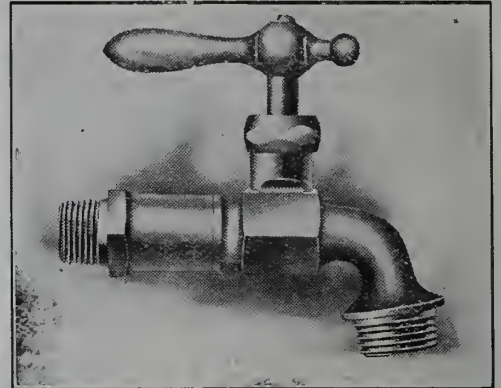


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MONTREAL, TORONTO AND WINNIPEG, JUNE 1, 1908

TORONTO TRADE RE-ORGANIZING.

From different parts of Canada the Plumber and Steamfitter has received letters expressing appreciation of the articles on plumbing requirements and regulations and expressing the hope that not only will the agitation result in the adoption of new codes of regulations at Toronto, Montreal, Winnipeg, Vancouver and other cities, and the preparation of modern by-laws at Hamilton and London (two cities where it is common trade talk that cheap goods and cheap work are the standard owing to the absence of by-laws and inspectors), but that life will also be given a movement aiming at the drafting and adoption of regulations providing for provincial licenses and examinations to protect the public from unsanitary work done by incompetents unable to reach the standard set by the Provincial Sanitary or Health Departments.

Correspondents from outside points state that they are willing to aid any movement to organize a provincial master plumbers association, as conditions are such as to make the trade unprofitable as well as making the work done of a cheap and unsatisfactory nature. It is pointed out, however, that nothing can be done towards getting the outside trade together until some large city takes the lead and issue a call for a convention. It is gratifying news under the circumstances, therefore, that the larger firms in Toronto, which have been organized on a year's agreement under the Employers' Association, have taken action towards broadening their organization so that instead of representing only three or four dozen of the larger firms all doing a legitimate business will be included. A committee has been appointed to bring in a report as to the best plan for future organization and it is expected that their recommendations will favor re-organization on a plan appealing to the intelligence rather than the pocket-book of all in the trade. With educational discussions on the cost and methods of doing business and on technical subjects the trade will be uplifted and the public benefited.

PROVINCIAL INSPECTION NEEDED.

The residential and traveling public of Canada and the United States are being awakened, by the many school, theatre and hotel fires which have occurred re-

cently, to the necessity of provincial regulations governing the heating, lighting, ventilating and sanitary requirements of public buildings.

Commercial travelers have always been advocates of a provincial inspection of hotels, in which they spend so much of their lives. They pay good money for meals and lodging and they are entitled to protection from the Provincial Government, not only in seeing that the rural district hotel pump is not located between the manure pile and an adjoining privy vault but also in having the latest fire escape appliances, ventilation in inside rooms, and decent sanitary arrangements in keeping with the age in which we live.

The installation of a number of untrapped plumbing fixtures in a Western Ontario hotel recently by an amateur plumber who had the nerve to tackle a job he had no ability to do, also illustrates the necessity of protecting not only the people who might contract disease as a result of inefficient sanitary installations, but also the rural house-owner who may think he is getting a decent job.

The Collinwood school fire, the many explosions in moving picture theatres, stampedes in town halls, churches and other public buildings, are also arousing the general public to the need of action on the part of the Provincial Governments.

Is not the present an opportune time to press for the establishment of provincial regulations governing the heating, ventilating and plumbing of all public buildings and is there not an opportunity for some legislator to make a name for himself by conferring with the practical men in the trades named and introducing legislation aiming to protect the public from a recurrence of the disasters entailing so much loss of life.

COMING CONVENTIONS.

American Foundrymen's and Brass Manufacturers' Association, Toronto, June 8 to 12.

National Association Master Plumbers, (also Master Steamfitters' Association), Boston, Mass., June 14 to 18.

American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., July 24 and 25.

Canadian National Master Plumbers' Association, probably at Quebec, about August 1.

INTER-DEPENDENT RELATIONS

No trade or calling occupies a more important relation to the well being of the human race than that of the plumber.

Wherever people are gathered together in communities, there reasonable sanitary measures are a real necessity for the protection of life and health. It is the plumber that is called upon to provide and install the required mechanical equipment necessary to sanitary conditions.

The more the public are aware of the benefit of good sanitary regulations and the more appreciative they are of the proper work in connection with the equipment, the greater is bound to be the call for the services of the plumber and the higher the standard of health conditions.

The physician has only to deal with the question of remedies and reliefs in the case of disease but the plumber and sanitary engineer have much more important matters with which to deal—the preventative means.

Whether or not the plumber occupies the position in the public eye that he should is a matter that in a great measure rests with himself. What is not asked for, and not merited is seldom received.

Let the plumber fully acquaint the public with the importance and necessity of his work and it is sure to receive its just recognition. The process may be slow but it is sure. To educate the public along any certain line is often a seemingly hard task, but concerted action can accomplish much that would otherwise seem impossible. Rational enactments through the statutes based upon the idea of the greatest good for the greatest number are just as reasonable for the enforcement of sanitary regulations and requirements as any other, and though such regulations may from one viewpoint or another of the individual, seem a hardship they are of the greatest benefit to man in his many sided relations to the balance of mankind.

The public does not and cannot object to reasonable regulations that are or may be preventive of unsanitary work, and when the public is brought face to face with the question it must be conceded that the only and proper trustworthy hands in which to place all sanitary work is in the hands of those who from a close study and application of the fundamental principles of the work, are best acquainted with the required necessities of various undertakings.

The trade or business of a plumber is one that requires, for the benefit of the public interest, special study and experience. No one to-day would think of employing a physician without a training and experience for the cure of any disease, nor should any one think any more of employing an inexperienced person to deal with that which concerns the prevention of diseases.

The government (the people) exercises its right to look into the capabilities of those who would cure diseases and why should it not do the same with those within whose powers lay very largely the preventive measures?

Under the complex conditions of life in our ever increasing populous communities and municipalities there is continuously brought before the plumber questions relating to the proper water supply and waste disposal in our houses tenements, apartments, hotels, schools, churches, theatres, factories, public and private institutions and other places of abode and work.

To properly deal with all these varying questions requires study and experience. The plumber in the intelligent pursuit of his work confers upon the public greater benefits than he can ever expect to receive consideration for at the hands of the public. The experienced and conscientious plumber is the warden of the public health

and health is the foundation of all life and its enjoyments, and just and reasonable sanitary regulations are absolutely necessary to its maintenance.

The sanitary officer or plumbing inspector is the representative of the people. It is to him through the just and equitable enforcement of these regulations that the public and the conscientious plumber must look for the full benefits from such measures.

There may be a few who are opposed to any such regulations, but this opposition arises from a lack of knowledge of proper sanitary conditions or some ulterior motive and makes it all the more necessary that there should be such regulations for the protection of the public health.

The more the public is acquainted with the great value of reasonable sanitary regulations and their proper enforcement the greater is the respect with which they are held.

Nuisances, which are brought to attention through the sense of sight or smell are quickly noticed and the public easily realizes the dangers at once that may arise from them, but there are greater dangers to which the health of the public can be subjected and which might pass unnoticed. These arise from defective plumbing, bad drainage, and improper sewage disposal and it is here that the public receives the greatest of all protection to the general health through the careful supervision of all work connected therewith and the enforcement of reasonable regulations, by and on the part of the plumbing inspector or sanitary officer.

HELP YOUR MEN.

You cannot expect an employe to sell your goods as well as you, when he does not know them one-tenth as well as you do, says Modern Sanitation. Do not, therefore, find fault with lost sales if you make no effort to help your men to better selling. When you find a good selling argument tell it to the men who meet your customers. When you read an article that teaches better salesmanship, show it to your employes.

Nine employers out of ten do not give their men sufficient credit for having the desire to do their best. If a man fails, they blame it on his carelessness, laziness or lack of interest. Generally it is through ignorance of the better way or through inability from lack of knowledge or experience. Most employes have the making of good men if they were trained.

Do not expect inexperienced men to sell. It's policy is to get under employes with help and training, and create in them the ability for good work. It does not take long to pass a helpful word or hint to the man who works beside you. Get better results from your men by helping them to better methods.

SEWAGE TREATMENT IN FRANCE.

Paris is the only town in France in possession of a national and organized system of sewage treatment. It dates back forty years, and consists, broadly speaking, principally of irrigation for agricultural purposes. So far, however—and the period of inception is a tolerably long one—the extent of surface under treatment is inadequate for the total volume of water to be dealt with. According to Dr. Calmettes, of Lille, the volume of water which escapes without treatment into the Seine exceeds 35 per cent. of the entire quantity. But better times are coming. Already many provincial cities in France are adopting other systems, and the Department de la Seine is erecting works to deal with 10,800 cubic metres of water daily.

How Plumbing By-laws are Constructed in Different Cities

Their Origin and Their Relation and Benefit to the Public—A Comparison of the Requirements of the Toronto, and St. Louis Plumbing By-laws.

Rules and regulations for the proper enforcement of sanitary measures are absolutely necessary for guarding the health condition of every community. The more populous are these communities the greater is the necessity for their existence and the greater is the need for their intelligent enforcement.

Regulations and rules of practice which at one time may have been good and sufficient do not remain so necessarily for all time to come, nor are any one set of rules and regulations applicable in every detail under all conditions.

Any one who has had occasion to look into the by-laws and ordinances of various cities relative to sanitary matters will at once notice their absolute lack of uniformity. In a large measure this lack of uniformity is directly attributable to lack of concerted actions, and the varying degree to which the public is awake to the need of proper sanitary measures. To a less extent it is due to certain varying local conditions.

Protection of Public Health.

At the same time, the same urgent need exists in every community for the construction and maintenance of good and ample means of drainage and sewage disposal together with the observance of reasonable regulations and supervision pertaining to the plumbing arrangements in every house and building of every kind for the ensurance of the greatest safety to the public health, and that the sanitary conditions in every detail shall be of the best attainable.

The making of all such laws lies with the people, and originates from the police powers of the government. Their observance, good, bad or indifferent, rests with the individual. Their enforcement is put in the hands of certain delegated representative of the people. The more definite and concise are these regulations, and the more appreciative the public are of the benefits of such regulations, the easier is their enforcement and the more beneficial are the results.

In many communities the enforcement of all sanitary measures and work in connection therewith is placed in the hands of a department or bureau known as the Board of Health. In many other places that which has to deal with the plumbing arrangements only, and supervision of their proper installation and maintenance is placed in the hands of a separate department. This latter course is looked on with favor by many as

the work is placed under the supervision of men experienced in the planning and execution of plumbing work in all details. In other cities the supervision of the plumbing is combined with the building department, with separate inspectors to deal with all plumbing work.

As said before, no one set of by-laws or rules are applicable under any and all conditions, but much can be learned by a careful investigation and analysis of the varying features of different by-laws.

Conditions in Different Cities.

In many cities general rules applying to plumbing work, have been more or less incorporated with rules and regulations of boards of health, water department, sewer department or building department so that the practice may be more or less influenced by by-laws or ordinances of other departments or branch departments that do not have to deal directly with the execution of plumbing work.

Such lack of comprehensiveness in the plumbing by-laws makes exact comparisons at a distance somewhat difficult, often divides responsibilities where not necessary and causes much confusion. Other by-laws are not explicit enough in many details, leaving open to dispute many essentials.

In other cases in the eagerness to bring about all the necessary precautions for the enforcement of proper sanitary measures it has caused much of the plumbing work to become extremely complicated, cumbersome and unnecessarily expensive. Many features have been introduced that might have as well been entirely omitted and left the entire work much simpler, easier of execution, and in many cases much better for the omission.

In many cases detailed rules are made to apply universally to a simple case of house plumbing where there are only a few fixtures and the building not more than two or three storeys high, the same as to an office building many stories high and where the fixtures run well up into the hundreds and thousands, and where the use of fixtures are many fold greater. In other cases just the reverse is the case as the regulations have not kept pace with the ever increasing complex conditions of life in growing cities.

Many by-laws and regulations are silent on construction and requirements

to be observed in connection with plumbing work in two-party houses, flats, tenements, schools, colleges, office buildings, garages, stables, living stables, various manufacturing plants, laundries and abattoirs. The special requirements applicable to any one of these are not applicable to conditions existing in others.

Both Plumbing and Health Departments

As illustrative of the varying requirements of cities we below cite extracts from the printed plumbing ordinances of St. Louis, Mo., embodied in the ordinances of April 6, 1889, July 9, 1889 and April 1, 1907, which are now in force, together with extracts from the printed by-laws of Toronto passed Feb. 22, 1904.

In St. Louis the inspection of plumbing work is under a supervisor of plumbing responsible to the Board of Public Improvements. The plumbing department is not under the jurisdiction of or connected with the health department. The work is looked after by seven inspectors, one clerk and the supervisor. The salaries paid are as follows: Supervisor, \$2,000; inspectors, \$1,440; clerk, \$1,200 and book-keeper \$1,000.

St. Louis is a city of 600,000 people and including the supervisor with the inspector gives a relation of one inspector to 75,000 population.

Sec. 2 of St. Louis ordinances provide: The President of the Board of Public Improvements, with the approval of the Mayor, shall appoint a supervisor of plumbing and drain-laying, who shall be, by training and experience, competent to design and execute plumbing work. * * * Inspectors shall be skilled and experienced in the work they are to inspect.

Bonds Required in St. Louis.

St. Louis (Sec. 7): It shall be the duty of every person, firm or corporation desiring to engage in the business of plumbing or drain-laying in the city of St. Louis, to have his, her or their full name, residence and place of business registered in the book kept for that purpose by the supervisor of plumbing, and in case of removal or change in the firm to have such change made in the register without delay. It shall be the duty of every such party to give a bond in the sum of two thousand dollars as a plumber, and in the sum of one thousand dollars as drain-layer, if the party desires to engage in both de-

partments of business, otherwise only for the particular department engaged in. Said bonds shall be signed by two good and sufficient securities, holders of unincumbered real estate in the city of St. Louis, to be approved by the Mayor and Council and filed with the Register.

In Toronto no bonds are required.

Qualifications for Plumber's License.

St. Louis (Sec. 5): Upon satisfactory proof of the qualifications and fitness of the applicant for plumbing license, the Board of Examiners of Plumbers shall thereupon issue to such applicant a certificate of qualification, which shall entitle the person named therein to engage in or work at the business of plumbing * * * for the period of one year. No person shall be entitled to obtain from said board a certificate of qualification except as in this ordinance, otherwise provided, who shall not have first passed a satisfactory examination before said board as to his knowledge, experience and skill of practical plumbing, house-draining and plumbing ventilation.

In Toronto no examination is required.

St. Louis (Section 7): It shall be the duty of every registered plumber and drain layer to keep on deposit with the city treasurer to the credit of contract and other deposits, at all times a sum sufficient to pay the fees for inspecting the work done by such plumber or drain layer.

In Toronto deposit is not required.

Fees for Inspection.

St. Louis (Section 7—: For each inspection of such work the supervisor of plumbing shall charge the sum of one dollar against said deposit, and the supervisor of plumbing shall be the judge, subject to the Board of Public Improvements, of the number of inspections to be charged for in any case.

Toronto by-law does not mention inspection fee.

Plans Required.

St. Louis: "The duplicate plans required by Section 5 of ordinance No 15,057, must be drawn to scale in ink and must show:

1. The name or names of the owner of the property.
2. The name or names of the plumber or drainlayer who is to do the work.
3. The exact location of the premises, by number of block, lot or house, and the distance of the side boundary from the nearest street.
4. The location of the building upon the lot by scale drawing or by figures.
5. The location of all fixtures and run of all pipes, with traps, connection and ventilation.
6. A clear description of the work to be done, number and kind of fixtures,

also kind and size of supply, waste, soil and sewer pipe must be furnished.

Plans may be submitted in the form of drawings only, or of drawings accompanied by written specifications. Drawings shall show plan and section, and be in sufficient detail to show fully the proposed work. One vertical section will be accepted if it can be made to show all the work; if not, two or more must be furnished. When the plumbing of a row of houses is the same, a detailed plan of one house will be sufficient, provided the work is all to be done under one contract.

The supervisor of plumbing shall place upon approved plans the numbers of the permit issued in connection therewith, and the serial number of the plan, and deliver the duplicate copy to the party filling the same, and place the original in the permanent file of the plans."

Articles 2 and 6 and the following paragraph are interesting. Under such ordinance it would appear that the plumber files his plans and specifications directly for work under contract and not as agent.

How Toronto By-law Reads.

Toronto (Section 7): "Before proceeding to construct, reconstruct or alter any portion of the drainage, ventilation or water system of any hotel, warehouse, dwelling house, or other building, the owner or his agent desiring to construct the same shall file in the office of the Medical Health Officer an application for a permit therefor, and such application shall be accompanied with a specification or abstract thereof in a blank form prescribed and supplied for this purpose, stating the nature of the work to be done, and giving the size, kind and weight of all pipes, traps and fittings, and a description of all closets and other fixtures, and also a plan thereof, showing the street and street numbers marked thereon, and the drainage system."

(Section 9): "All plans must be legibly drawn in ink on heavy white paper or on tracing linen and on a scale of eight to an inch."

Defining Repairs.

St. Louis: By minor repairs are meant repairs of leaks in pipes, traps and cocks; opening up waste or supply pipes, traps and drains, and repairing broken fixtures and frozen pipes.

Toronto: Not specially defined.

Uninspected Work Forbidden.

St. Louis: All plumbing work must be tested before it is accepted. When it is inconvenient or impracticable to test the whole work at one time it may be tested in sections. All tests must be made by water, air or smoke, as the supervisor of plumbing may require. If it is made by air or smoke, it must be

under a pressure of not less than ten pounds to the square inch, and the pressure must be applied in the presence of the inspector and maintained for not less than five minutes. Plumbing work shall not be used until inspected and tested. Tests of sewer pipes must be made with water, the pipes must be plugged through the fresh air inlet and then filled with water from the most convenient place. After all the fixtures are connected and the traps filled with water, there shall be a final smoke test with a pressure equal to at least one-half inch of water. Plumbers are required to make full returns of plumbing work done by them within forty-eight hours after completion.

Toronto: The Medical Health Officer or the inspector appointed by him may require either a smoke or water test, which test shall be made by the party whose work is being inspected, except in the case of a smoke test, when the Medical Health Officer or inspector is supplying the machine or instrument to make such test, and the result of every inspection shall be recorded in the office of the Medical Health Officer. At such seasons of the year when the water test would not be safe by reason of frost, such shall not be used. If the work is not found satisfactory after being tested, two days' notice shall be given to complete the same, and if the work is not made satisfactory within that time, the penalty prescribed by this by-law may be enforced forthwith. The smoke test shall in all cases be applied to finished plumbing work, and after the expiration of seven days, if the work is found satisfactory, the plumber shall take out the certificate for the same provided for in Section 22 hereafter.

Drain and Soil Pipes.

St. Louis, (Sec. 1611): Drain and soil pipes through which water and sewage is used or carried, shall be of iron when within a building and for a distance of five feet outside of the foundation walls thereof, and where any sewer pipe passes within 25 feet of any well or cistern. . . . Iron soil or drain pipe shall be sound, free from holes and other defects, and of uniform thickness. If of cast iron they shall be not less than one-eighth of an inch thick for a diameter of four inches or less, or five thirty-seconds of an inch for a diameter more than four inches and less than six inches, with a proportionate increase of thickness for a greater diameter. Inside of buildings they shall not be covered, but shall be placed as required by the regulations. They shall have a suitable trap, with an accessible clean-out, placed either inside or outside the foundations of the walls of the building; they shall have an air or vent pipe of suitable size and position.

"The soil pipe shall have a continuous

fall, and should be run along the cellar wall if possible. Soil pipes shall be securely ironed to walls or suspended from floor timbers by strong iron hangers, or be supported by piers. When it is not possible to support the soil pipe as above provided, it may be placed in a trench in such a manner as to be readily accessible. There shall be a foot rest at the bottom of all stacks of soil pipe. There must be a clean-out at the foot of each vertical line of soil pipe and at each junction and change of direction in cellar."

Soil Pipe in Toronto.

Toronto (Par. 3): All soil pipes

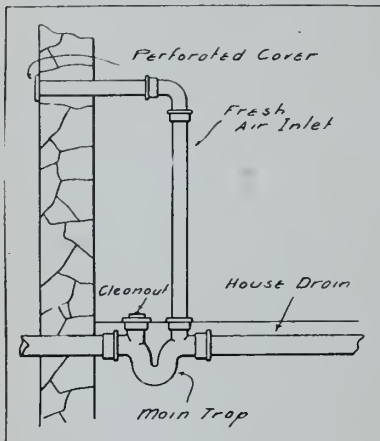


Fig. 1—Main Trap with Old-style Fresh Air Inlet Connection.

within the walls of any building shall be of cast iron when not covered with earth, and shall be continued at least three feet above any opening in the roof, which may be within fifteen feet of same, and three feet above any opening into any adjoining building or extension, when such building or extension is within fifteen feet of such pipe, and be left open, so that the whole of the inside drainage may be thoroughly and constantly ventilated. All soil and vent pipes, when they pass through the roof, must be properly flashed with five-pound sheet lead, and made water-tight.

Par 4: Approved tile pipe may be used underground. Tile pipes in underground drainage shall be of the best material and free from all blisters, cracks, flaws or defects of any description; all junctions must be curved; no right-angle junctions will be allowed; all joints must be put together with the best Portland cement, properly mixed and tempered, and finished flush with the edge of the pipe; the joints on the inside of the drain to be in all cases properly cleaned and finished so as to be perfectly free from all burrs; drain shall have a fall of not less than one-quarter of an inch to the foot.

Par. 5: If the house is drained by a continuous iron soil pipe from the outer connection with the house drain

at least three feet outside the wall to the opening above the roof, as hereinbefore provided, the trap and the fresh air inlet may be dispensed with.

Par. 6: The pipe shall have two cleaning-out screws, one to be about 12 inches above and in front of the bend at the basement floor, and the other between the said bend and the outer wall of the house; in case of a continuous iron drain cleaning-out screws or airtight hand hold fittings must be attached, whether main trap is used or not.

Sec. 6 in part, Toronto: No iron pipe shall weigh less than the following per length of five feet:

6 in. diameter	100 lbs.
5 in. diameter	85 lbs.
4 in. diameter	45 lbs.
3 in. diameter	30 lbs.
2 in. diameter	20 lbs.

Main Trap of House Drain.

An article published in The Plumber and Steamfitter of March 11, 1908, concerning the use of the main trap, says in part:

"When the main trap is used at the house drain, its presence prevents the use of the stacks passing through the roofs of the town or city from supplying a system of vents for the public sewers.

"While it is undoubtedly true that the system of public sewers of any city re-

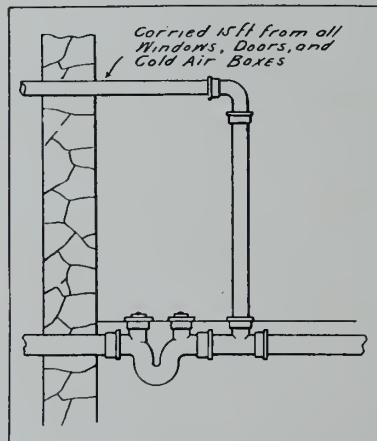


Fig. 2—Correct Fresh Air Inlet Connection.

quires ventilation, the turning of every stack in the city into a vent for the sewer is certainly a serious and debatable matter.

"While not denying that if this ventilation could be provided through each house without serious results, it would be an excellent method of venting the sewers, we believe the disadvantages of such practice to be too great to warrant the disuse of the main trap.

"To our mind, the main trap represents a protection for the entire building, fixtures, joints and all the special connections mentioned.

"While under our modern system of

inspection a newly-constructed plumbing system may be tight, there is no question whatever that a test applied later, after the building has been in use for a time, and the foundation and floors have settled, as they often do, would show many defective joints, and connections and other defects. The main trap acts as a protection against the entrance of gases into the house through such defects. It seems to us the right thing to do is to guard against such dangers by using the main trap in preference to any other."

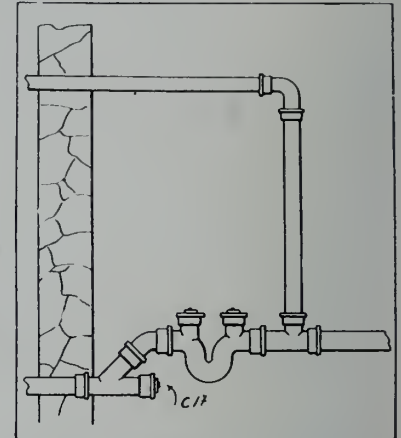


Fig. 3—An Excellent Connection at Main Trap.

ST. LOUIS EXAMINING BOARD.

The work of the St. Louis Board of Examiners of Plumbers, says the Plumbers Trade Journal, has been of great practical value to the trade, and the methods followed thoroughly progressive and adapted to an intelligent and just execution of the law creating an examining board.

We publish herewith a cut of one of a series of illustrations in colored chalk used by the board in a portion of the examination, which admirably served the purpose of both catechism and primer, giving a candidate the opportunity both of displaying and acquiring knowledge.

The black and white drawings will readily suggest to all plumbers interested in educational movements the value of the originals in color, clearly depicting air, water, gas metal, etc. This and several other series of color scheme drawings have been copyrighted by the designer, John J. Foy, of Los Angeles, being executed by him in 1907, while he was serving on the St. Louis Board of Examiners of Plumbers.

A glimpse at the many features presented in the combination sketch will give an idea of the strenuous work of this energetic and enterprising St. Louis examining board. In the first place, there is to be seen about every style of trap known to the plumbing trade, from the old trap to the present

How Many Gallons?
5' x 2'

A 24" x 24" = 576"
B 576" x 7854 = 452.39 sq ft
C 452.39" x 60" = 27143.4"
D 27143.4" = 231 Gallons in Tank

Quick Method
7 1/2 gals to cu ft

4' x 4' = 16'
16' x 4' = 64'
64' x 7 1/2 = 480 gals

What Pressure at Foot of 100 ft Column of Water?

"A" 100' 100' 12' to ft
434 lbs to ft 2711200 14 1/2 lbs.
480 lbs to sq in 108 120 108 1 1/2 = 1/9

2" Diam
A Find Area
B Find Circum
Ans
"A" 452.39 sq ins
"B" 62832 ft

Comparative Flush of Same Volume Water in 4" 8" Drain.
8" Carries 4 times 4" Pipe (ignoring Friction)
4" x 4" = 16"
8" x 8" = 64"
64 - 16 = 4 Times

Boiler 20" Diam
Pressure 30 lbs sq in
Find Total Bursting Pressure - Ans 9424 lbs

Why Good?
Why Bad?

modern style, and even to the grease trap. There is shown the manner and method of finding how many gallons, square, round and other shaped tanks will hold for the purpose of enabling the plumber to figure on lining same. There is the right way and the wrong way for performing different styles of work. Venting is carefully shown. A complete system of plumbing is outlined, with the query "Why good, or why bad," and so on, each particular system being tabulated for the purpose of allowing the examining board to lecture and explain, if necessary and desirable. The principles of circulation are to be seen and truly, taken all in all, this little sketch combines about every feature that is to be met with in the ordinary consistent plumbing work of a residence. It can easily be seen that it is the prime effort of the St. Louis examining board to obtain the candidates' ideas of the reasons for each essential feature of plumbing, to allow an opening by which an explanation of bad and devious ways might be given, and all in all, any candidate that could cover satisfactorily all details as printed on the St. Louis chart, would certainly be able to prove himself a mechanic whose practical knowledge of the trade could never be questioned.

Examining boards to be appointed in Canada could not do better than apply for these charts, which are copyrighted by Mr. Foy, and use them in the various sessions they have with applicants for plumber's license. Those boards that desire any further information can obtain same by addressing the Plumber and Steamfitter, Toronto.

Discussing the work of the plumbing department of St. Louis, Edward Quinn, supervisor of plumbing, and recently elected president of the American Society of Inspectors of Plumbing and Sanitary Engineers, writes The Plumber and Steamfitter as follows:

"We have about 450 master plumbers who are registered in this office and about 600 journeymen plumbers. The master plumbers are required to give a bond to the city for \$2,000 as a master plumber and the sum of \$1,000 as a drain-layer. The journeymen plumbers are not required to give a bond, but have to undergo an examination the same as the master plumbers before the Board of Examiners of Plumbers, of which I am chairman, and pass a satisfactory examination as to his quality and fitness before he can engage in the business.

"We have just about finished the examination of all the plumbers and it has kept up very busy for the last year. The fee charged for the examination is \$1 for each applicant, and should the applicant fail to pass upon the first

examination he may appeal to the Board of Public Improvements, and if he can show that he has been aggrieved by any member of the Board, will be given another chance.

"In my opinion every large city will do well if they copy by the example set by this city, and make provisions for the examination of all plumbers. We have refused certificates to about forty master plumbers and about the like number of journeymen, and up to the present time there has not been any of those who have attempted to take this into court.

"The present ordinance has been in effect for the past 19 years, and during that time I have been in office as supervisor for the last six years, and I find that the whole thing depends on the chief inspector. If you have a man at the head who will close his eyes to everything, the city will be better off without an inspector, because it is his duty to protect the public.

"I think every city should have an examining board for these reasons: 1st, The plumber will not take chances of having his license revoked for doing inferior work, and 2nd, Any citizen can prefer charges against any registered plumber before the Board of Examiners and if found guilty have his license revoked. I would like to hear from you in the near future what progress you have made."

TO STOP JERRY PLUMBING.

Building Superintendent Murphy, of New York, has issued an official order, governing in Manhattan, to do away with a pernicious form of jerry plumbing, which consists in the use of what is known in the building and allied trades as "lightweight" cast iron pipe. Cast iron pipe is required for all house and sewer drainage plants and for most of the interior plumbing fittings of buildings of all classes of construction. When such pipe is of light weight it becomes a prolific cause of the spread of sewer gas and the creation of other unsanitary conditions.

The edict against its use was the result of the discovery that despite department regulations to the contrary, certain contractors on new building jobs in various parts of Manhattan were fitting these buildings with piping much below the standard weight and noticeably inferior in quality, which cracked easily. The superintendent held a conference at the department offices with a committee of the Master Plumbers' Association and announced that the department proposed to put a stop to the jerry work. The committee gave assurance that the members of the association will co-operate with him.

The superintendent's order is to the

effect that no cast iron piping shall hereafter be installed in any building in Manhattan until written notice is first sent to the department and opportunity given to an inspector to examine and if need be, weigh the pipe. All the plumbing inspectors have been supplied with new vertical scales for weighing the pipes, their use being a novelty in department inspection. The scales are capable of registering up to 150 pounds and are carried in oblong boxes.

WESTERN OUTLOOK BRIGHTENING

J. T. Sheridan, president of the Pease Foundry Company, Toronto, returned last week from a business trip to the west, where he went for the special purpose of sizing up the business prospects for the coming year. He found the outlook much brighter than expected, and states that with favorable weather for two or three weeks, all danger will be past and the greatest crop on record will be harvested in Western Canada, there being 1,000,000 additional acres under cultivation and the crop being at least a month ahead of a year ago. Instead of cutting down the staff of the company's western branch, the Pease Waldon Co., Winnipeg, Mr. Sheridan expects to inaugurate a more active selling campaign than ever during the coming season. While at Port Arthur, Mr. Sheridan was offered inducements to establish a branch plant at that city but for the present the erection of a western plant will not be gone on with, although it is only a question of time before it will be necessary to make such a move.

MUST IMPROVE TRADE CONDITIONS.

Editor Plumber and Steamfitter,—I am glad to see the stand you have taken in trying to impress upon the trade of this country the need of better sanitary conditions, and also the necessity of getting better prices for their work.

In a good many towns and cities in this country where there are no plumbing inspectors, there is no standard to go by, and the plumber who would like to put in a good sanitary job is forced to use poor material and throw in his work in order to meet competition. The only way I think trade conditions in this country will be improved, will be to have plumbing inspectors, and the only way the trade will get better prices for their work is to have a good live plumbers' association.

O. G. ROBB.

London, May 30.

W. G. Harris, of the Canada Metal Co., Toronto, left last Saturday on a holiday trip, in which he will visit Great Britain and the continent.

How Plumbing was Done in Montreal Fifty Years Ago

J. W. Hughes in a Reminiscent Mood—Early Sanitary Arrangements—The Cesspit in the Yard—The Lead Bath—Old Time Heating—New By-laws Considered Necessary—Extracts From a Lecture Delivered before the Montreal Architects' Sketch Club.

It is nearly fifty years since my active interest in matters connected with the building trade began, and during that time many changes in almost all departments of the business have taken place. Plumbing has almost completely changed in men, methods and materials. We are so much occupied by the affairs of to-day, that little time is afforded for a review of the past, always a profitable thing to do, provided we make the proper deductions and learn to apply the lesson.

The plumber as he was known to me in my early years, was as the name implies, a worker in lead, the name being taken from the old Latin name of the metal "plumbum," lead. To-day, while he still uses lead, he is a worker in iron, wrought and cast, brass, copper, glass, porcelain and marble.

Early Plumbing in Montreal.

As to the changes in methods and materials, I will describe, as nearly as memory will permit, the plumbing of an old-time house of the better class in Montreal, which still stands. The provision for sewage consisted of a cesspool in the yard. This was a large hole in the ground, walled round with rough stones, (sometimes with cedar logs). About three feet below the surface of the ground, cedar logs were laid over the opening, and the earth filled in, occasionally (not always) a manhole was made to give access to the pit for cleaning or observation purposes, but this was rather the exception than the rule, and I have vivid recollections of time spent in trying to find where the cesspit was located, when some derangement of the sewers made it necessary to see what the conditions in the pit were. There was no thought of ventilating the pit; no one knew of any necessity for such a thing. Sewer gas (and there is no such gas known to science) and the microbe had not been discovered, and people were not worrying themselves about what they did not know. Many of these pits gave no trouble; they were known as leaching pits, being built in sandy or gravelly soil, the water disappeared, leaving only the solid matter. Some years ago I had occasion to enter one of these pits that had been in use a great many years, probably fifty, and there was nothing in it except about 6 inches of a fine black earthy matter. When the pit was sunk in hard, or clayey soil, there was trouble

from flooding.

From the pit there would be built what was known as a barrel drain, made of brick, round, built with ordinary mortar, and the old-time specification called for the leaving out of a brick on alternate sides a yard apart. This was to provide an outlet for sub-soil water. Think of this, as compared with to-day's practice, when, if the house tenant knew there was a hole in the drain the size of a pencil point there would be a terrible todo.

The Old Barrel Drain.

This barrel drain would usually be run as far as where it was necessary for the plumber to branch off for his soil pipe stack. This soil pipe and its



J. W. Hughes, Montreal.

branch under the floor, was of lead, generally four inches in diameter, made of 5 lbs. of sheet lead turned up on a man-drill, and the longitudinal seam soldered. It was introduced into the drain by simply cutting a hole in the side and pushing the lead pipe into the hole. There was no attempt at cementing it or otherwise making it air-tight. When the lead branch reached the point where the soil pipe stack began, an ordinary lead head was fitted and the lead soil pipe carried up as far as the second floor.

There were very few houses that had more than one w.c. There was fitted a lead trap, on top of which was fitted what was practically the only closet we knew—the pan closet. Into this trap would be connected the half-inch lead waste pipe, that served for the

bath and basin—or if there were a number of basins in the different bedrooms, as was sometimes the case, the closet trap served for all of them. The question of fitting a separate trap under each fixture never came up. It was considered good practice to fit the end of the waste pipe below the water seal, but this was not always done, and was not considered of importance. It will be understood, therefore, that in many cases every opportunity was afforded for a circulation of air from the w.c. trap into the bath and bedrooms.

One Trap for All Fixtures.

The pan closet was unsanitary to a degree, having large, unventilated spaces, the air from which could freely escape into the apartment through the opening in the trunk of the closet. This w.c. and pan was flushed from a service pipe three-quarter inch in diameter connected to a cistern overhead, and had a service box that held enough water to fill the pan after the handle had been let down. The cistern was, as a rule, the cistern that contained the water supply of the house, and a division was placed across it, to form the hot water compartment. The w.c. was enclosed in handsome woodwork, in fact, cabinet work, generally of Spanish mahogany, nicely panelled, and put together with screws, when the architect and plumber could get the carpenter to use them, but there was a standing quarrel between carpenter and plumber on this point, as nails seemed to be the carpenters' pet, and when the plumber had to get the woodwork off to make necessary repairs, the destruction and disfigurement of handsome and expensive woodwork was something pitiable, and the plumber's character still suffers from the reputation he then made as a vandal and destroyer of property.

The Old-time Bath.

The wash basins were much the same as at present in use, but we had no oval basins. The slabs were marble, and the woodwork elaborate, the enclosure under the basin being used as a general storage place for all sorts of rubbish. The basin was not separately trapped, the w.c. trap serving for the basin or basins and bath.

The baths were usually of lead, fitted nicely in a wooden box. The lead was put in in two pieces, the body and head being in one piece and the end soldered

in. The fittings were the same as now in general use, that is, the standing waste and washer, with the water coming in from the bottom or end, but instead of the fittings being nicked brass, they were made of lead, with brass mountings, the cocks and drop plug being of brass. On top of the woodwork was fitted a nicely engraved plate indicating hot, cold and waste. This form of bath supply and waste was abandoned years ago as being unsanitary, as it certainly is, but has been revived as part of the open plumbing work system, the objection to it being the large surfaces that are not properly flushed and inaccessible for cleaning. The usual panelled woodwork enclosed the bath, and they were frequently fitted with hot and cold showers, made of lead pipe, in a very ornamental manner. The only survival of the enclosing woodwork is the cover to the w.c. seat, and why it is still retained is more than I can say, it serves no useful purpose, is a source of expense, and if it covers up anything in the w.c. bowl that should not be there, it is a nuisance. A w.c. is a w.c., and covering it does not add to its beauty or usefulness.

The pantry sinks were of lead, fitted with the usual brass plug and washer; and trapped with the ordinary P. trap. The kitchen sinks were almost invariably of stone. They were generally set in the recess of the basement window, supported on brick piers, with a space left for the trap. It was a nice job for the plumber to wipe in the brass plug washer in the recess left for same in the stone, as, if he was not careful in getting up the necessary heat the sink would be split, and they were expensive, being chipped out of a solid piece of native limestone. The sink would be trapped, but why is a mystery, as the waste would be simply dropped into the barrel drain, immediately below it, and as the drain was open, the trapping of sink was a useless expense.

The fitting of a ceiling vent from the w.c. apartment was an unknown quantity. They were not fitted, but there always was a window in the w.c. room, which is more than can be said of some of the modern houses.

The Water Supply.

Having briefly alluded to the waste and soil pipe system, it is now in order to take up the question of the water supply. There was generally two sources from which the water was taken. The well in the yard, for hard water, and a cistern supplied from the house roof gutters and spouts for soft water. These cisterns in the better class of houses were elaborate affairs built of brick and cemented, there being a portion separated from the general cistern by a soft brick partition,

through which the water filtered. Beside the sink was set a pump, frequently made of lead. This pump was connected to the suction pipes of the well and cistern so that by opening and shutting the cocks, either hard or soft water could be pumped; from the pump ran a lead rising main up to the cistern, in the attic, or perhaps over the w.c., with a tell-tale pipe from the top of the cistern, water running from which gave the information that the cistern was full.

From the storage cistern was run a water service pipe to supply the different fixtures, and instead of the hot water boiler now in general use, a portion of the cistern was partitioned off, and served as the hot water reservoir, there being two pipes run from it to the range, a flow and return. This portion of the cistern was fitted with a cover; but the general storage cistern was left exposed to what might come along, and sometimes queer things happened. It was not uncommon for rats and mice to be drowned in the tank, and on one occasion on hauling to uncover the soft water tank under the basement floor, my attention was called to some dark object floating on the water. On further investigation it turned out to be the mortal remains of the pet cat that had been missing for some time.

Heating Apparatus.

Wood stoves were in universal use and I had been some years at the trade before the introduction of the first coal burners for either heating or cooking. From the kitchen range through a flange in the floor the smoke pipe was run up into the dining room, and on it was fitted a dumb stove. This was a large radiator, through which the smoke passed before it entered the dining room chimney. In the hall stood a box stove capable of taking a three-foot stick of wood. On the top of the stove was fitted a gallows pipe, another form of radiator of the same class as the dumb stove, but of a different shape. On top of the stove stood the evaporator. Why do we not provide for evaporation now? It is much needed and would make for comfort and economy. After the smoke had passed through the gallows pipe it was carried through pipes along the hall and up through the well of the stairs between the hand-rails, along the upper hall through the front bedroom into the chimney. And there you have the old-time heating apparatus in the ordinary dwelling, many of which still stand. These houses were not uncomfortable, because in their construction great care was taken to keep out the cold.

Imagine what a domestic disturbance it was every spring taking down the

stoves and pipes, cleaning them and storing them away in the attic or woodshed. Then in the fall they had to be taken out and refitted. This was the tinsmiths' harvest time—the plumber was a point above that sort of work. He was no tinker in those days. To-day with the hot water furnaces, it is up to the plumber. Just imagine houses stores, churches, schools, court house, public halls being warmed with stoves on the general lines I have described, but so they were, as I well know, as my first experience was as a tinsmith, and if I am a plumber to-day it is largely owing to my desire to escape the terrible stove-piping of spring and fall.

Early Hot Water Heating.

But there were at least two houses warmed by hot water. The method in one case was different from what we now employ, and it possessed some features that, it seems to me, might be employed with advantage to-day, and do away with the unsightly radiator. Instead of each room having its separate unit, the coils were run all around the house in a box, lined with lead, below the floor, about six inches from the baseboard, all around the house, and the pipes were covered with iron screens let in flush with the floor, and there was one screened box coil in the rear hall. This form of apparatus was not unsightly, took up no room, and gave most excellent results. The objection to such an apparatus was that the box under the floor was a dirt catcher, but as the gratings were not fastened down in any way, being held in place by their own weight, they were easily removed for clearing purposes, which is more than can be said for some of our modern screened coils, and the different rooms could not be kept at different temperatures.

The furnace was of wrought iron made in Greenwich, England, and burned soft coal or wood. Instead of the ordinary air cock, as now used, each coil had run from its high point a quarter-inch block tin pipe. These pipes were carried to the attic and turned over a small expansion tank.

Lighting Arrangements.

The universal giver of light in those days was the candle, besides lamps of various patterns for burning oil. I have seen public meeting places lighted with candles hung around the walls, and it would be the duty of some one to go around from time to time and snuff the candles.

Ventilation.

As far as the ordinary houses were concerned, there was not any special effort made to ventilate the dwellings,

except that the hall stove with its roaring fire was a most excellent and effective ventilator. It used up a large quantity of air, and this air had to come in from outside, so the old-timer had a ventilator lacking in the modern house, where the furnace is generally in the cellar.

The masses of the people in my early days in Montreal were not troubled with plumbers' bills, because they had no plumbing in their houses. While there was a waterworks, and certain streets were provided with mains, the introduction of water into the houses was by no means universal, and there were large districts where there were no mains. The water was distributed from barrels drawn on a two-wheeled cart, carried into the house in tin pails of a regulation size, the price being three pails for a penny.

It is only a few years ago that on making some repairs to a w.c. in a warehouse that I found there were no drains to the premises, but the w.c. pan was set in the floor over a stone pit, just inside the entrance door, and this had existed for many years. Another case disclosed the fact that the drains did not connect with the street sewer, but discharged into a large stone vault in the cellar of the warehouse. I mention these facts to show the vast change for the better that has taken place in my time, not only in methods, but in the ideas of the people, as to what is necessary.

The first building in Montreal to be wired for electric lights was fitted up by my employer. We knew nothing of switches, cut-outs, porcelain insulators, and the whole assortment of electric fixtures and fittings. We used the ordinary electric bell cone, bored a hole and threaded it through, and never had a fire.

Great Changes Made.

The great difference between the plumbing of to-day and that of the earlier days is in having tight drains with special cleaning facilities; the substitution of heavy cast iron for wood, brick or tile; the carrying of the soil pipe full size through the roof, and back venting; also the introduction of the various forms of modern water closets of the wash-out, wash-down and syphon designs—with their ample traps and large flushes, in place of the old-time and universally used pan closet, with its thin squirt of water from a three-quarter-inch pipe. Also the fittings of vented or non-syphonable traps to each fixture; open plumbing; the introduction of the enameled fixtures, and the fitting of apartment vents in all w.c. rooms.

In the bygone days we had no sanitary code, no plumbing by-laws, no

health department, with its officials and rules. All this marks a great change and advance in public opinion. We are by no means perfect in such matters, but progress is being made every day.

The erection of large buildings has led to the introduction of the circulation pipe, the fitting of which gives hot water immediately after the opening of the tap. This is not called for in an ordinary sized dwelling, though many architects specify it. The almost universal introduction of the copper or iron bath boiler, in place of the old-time open tank to which I have alluded, was also a great and favorable change in the right direction from a sanitary point of view.

Standard Specifications Required.

There is one advance yet to be made, and that is the introduction of a standard plumbing specification. This would save time, confusion and temper, would result in the standardization of work. At present the architect must spend hours in writing specifications, many of the details of which are wrong, because, as a rule, a clause is inserted that the plumbing by-law must be complied with, and it often happens that some of the clauses written in are not in accordance with the by-law. This law is by no means perfect, but with the co-operation of our architects, master plumbers, and the assistance of the health department officials, which we certainly will have, an up-to-date law should be an accomplished fact in the near future.

PLUMBING BRISK IN VANCOUVER.

"Trade just now is brisk, and the plumbing business generally is in very good shape," was the reply of Matt. Barr, of Barr & Anderson, of Vancouver, to a question put by The Plumber and Steamfitter correspondent. "Plumbers are fairly busy, and indications for a good summer are bright. The situation is encouraging. At present we have 65 of a staff employed, which shows considerable business on hand." This firm has several large contracts not only in this city but also in Victoria and Prince Rupert. They have started on the contract of installing the plumbing in the large new federal building, which work will bring them \$10,000. Other jobs are: In Vancouver—plumbing and steam heating in the Loo Gee Wing building on Hastings St., \$14,000; plumbing and steam heating in the Gibb apartment building, \$20,000, besides minor work. In Victoria—plumbing and hot water heating in St. Joseph's Hospital, \$18,000. In Prince Rupert—steam heating in the

Prince Rupert Inn and similar work in the Annex, which is a separate building, both to total \$8,000; plumbing in the offices of the engineering staff, and also in a private house.

NATURAL GAS FOR LONDON.

A company is being organized to pipe natural gas from Port Dover to London, St. Thomas, Woodstock, and neighboring places. A large tract of proven territory has been secured and seven wells, producing 3,700,000 cubic feet per day, have already been put down. It will take ninety days to lay the eight-inch iron pipe line, and the promoters expect to have the gas in London this summer.

ACETYLENE A SAFE ILLUMINANT.

The United States National Board of Fire Underwriters at a recent meeting amended the rather drastic rules covering the installation and use of acetylene generators, permitting that in all outlying districts generators may be placed inside, but in closely built up districts outside installation is to be preferred; though it will not be necessary to construct strictly fireproof houses for this purpose, as in the past.

The investigations which were set on foot for the purpose of ascertaining facts brought forth the conclusion that in view of the fact that the number of acetylene generators installed inside of buildings had very largely increased in the past few years, while, at the same time, the fire records seemed to show that the number of fires ascribed to such installations had, if anything decreased, the rules of the National Board covering the construction and installation of acetylene apparatus had apparently safeguarded the hazard to a very great extent, and acetylene was proving itself to be a safer illuminant than those which it had replaced.

GAS-HEATING INVENTION.

E. A. Shipley, heating engineer, Vancouver, has invented a patent gas heater the Canadian manufacturing rights of which have been sold to a Hamilton concern. One of the heaters is used in the Vancouver Athletic Club building to warm the water in the 35,000-gallon swimming tank. Mr. Shipley is negotiating with several American manufacturing firms for the sale of the United States rights. A public natatorium will be built near English Bay, B.C., in which soft water will be heated by a battery of these heaters, so that swimming may be open the year round.

Novel Method of Ventilating a House With Cave Air

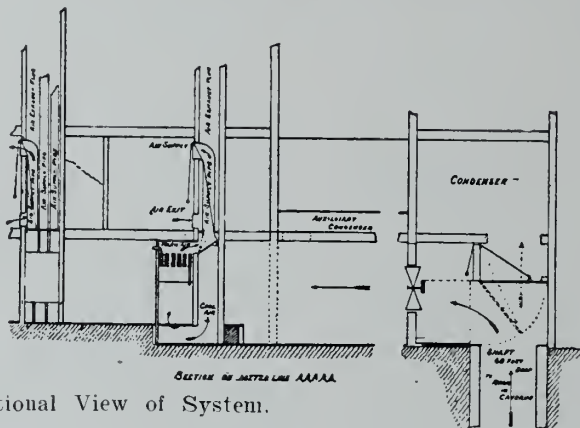
C. H. Claudy, in the *Scientific American*, Tells How a Retired Ventilating Engineer Regulates the Temperature of His Home Without Opening Windows.

In Page County, Virginia, a mile from the town of Luray, stands a house that is perfect in its ventilation, and whose inmates breathe as pure air as any house dwellers in the world. The house is built on top of a hill, above the famous Caverns of Luray.

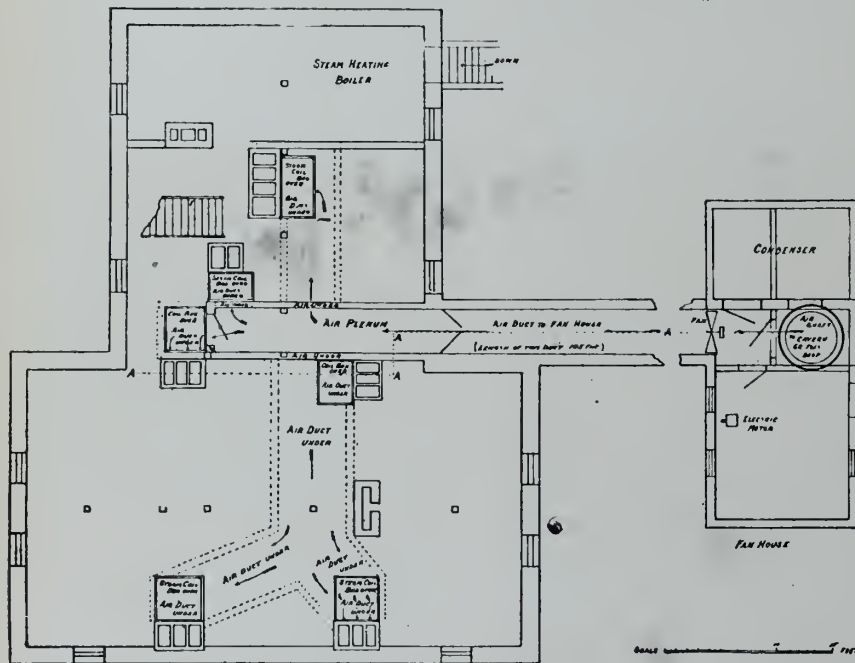
Connecting the caves with the surface is an artificial air shaft. Connecting

secure property on which could be built a house embodying some pet theories, one of which is to the effect that air filtered through limestone is pure and healthful and aseptic. Now, as to the practical advantages; in the first place, the entire cubic contents of the house is changed every four minutes during the day and night, so there is never any

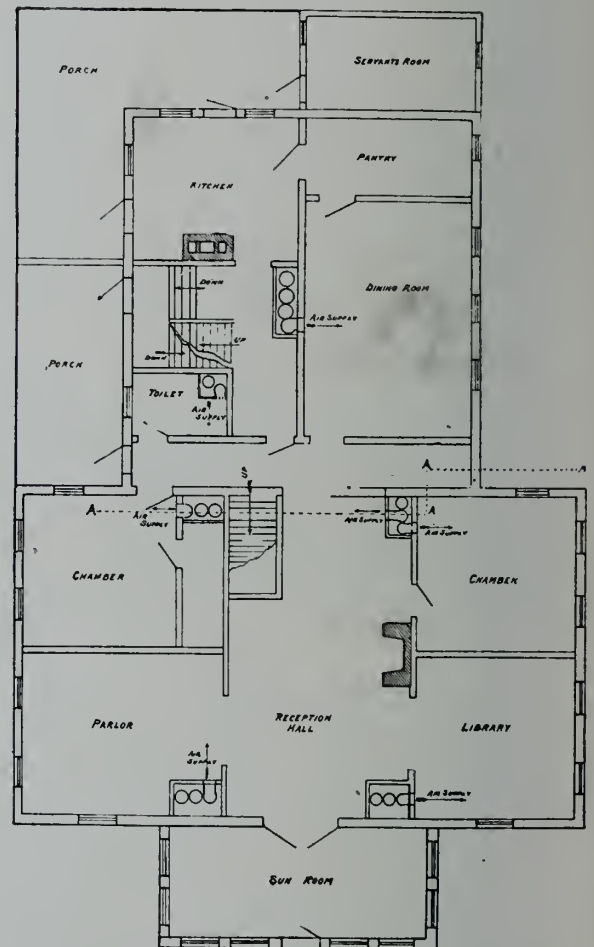
house is under absolute control. On the hottest day in summer the interior of the house is cool and comfortable at 70 deg. An open fire can be built every night in the year with comfort, and is built frequently even during the summer. In the winter, the cave air, slightly warmed by passing over steam coils, heats the house, and the inside is always at 70 deg.—or whatever the particular temperature desired may be. Finally, the humidity is always normal in "Linair"; it is regulated to 70 per cent. at a temperature of 70 deg. Less is too dry; more, too damp.



Sectional View of System.



Plan and Elevation of the Basement, Air Duct and Air Shaft.



First Floor Plan Showing Air Shafts.

this shaft with the house is a large passageway, and through this passageway, air from the caves is pumped into the house at the rate of eight thousand cubic feet a minute. "Linair," the name of this unique homestead, is the result of years of labor and preparation. T. C. Northcott, who built and owns the house is a retired heating and ventilating engineer. It had long been his dream to

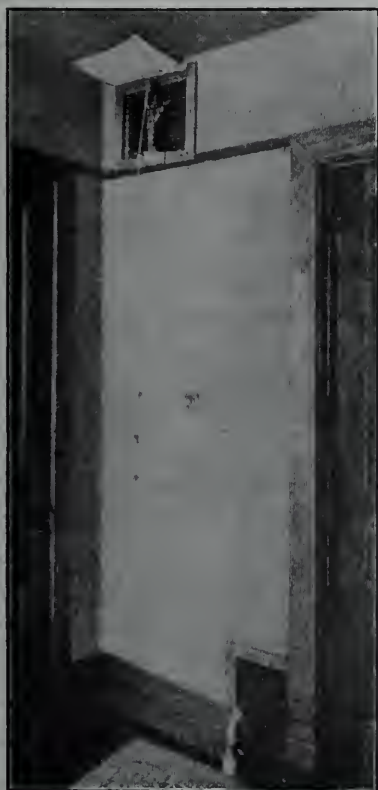
foul air. As the air is practically germless, no sickness can ever be contracted in the house from germ causes. As the ventilation is so perfect, windows need never be opened except for cleaning them, and the result is a house which is nearly dustless. As the air supply from the caverns fluctuates in temperature only two degrees in the year, from 54 to 56 deg. F., the temperature of the

Tests Show Pure Air.

Tests have been made with culture mediums and plates to determine the amount of bacteria in the cave air, and all but very few of the results were entirely negative, the two or three positive results revealing so minute a quantity of germs as to be practically negligible. It is interesting to compare the results made in different localities. For

instance, on tests made in the caverns, in various parts, on twelve plates there were two colonies! In nine plates in the house, six colonies resulted, in one test.

In one plate in a nearby farm house, perfectly clean and considered a fine



How Air is Received and Discharged.

dwelling, 143 colonies resulted. On one plate made in a city back yard, 450 colonies resulted. On one plate made in a New York street car 1,600 colonies resulted. Two plates in the finest operating rooms in Johns Hopkins University showed 65 and 58 colonies. In other words, the cavern air is practically germless, aseptic, and pure.

How can the air from a dark, damp cavern be pure and sweet like the air which is sunlit and constantly moving? All the air in the cave is drawn from outdoors, and has been sun-cured! Moreover, it is not stagnant air at all; the difference in the temperature from inside and outside keeps up a constant circulation of air, which is drawn in and exhaled through thousands, probably, of small openings in rock and earth. The air is filtered through limestone

Limestone Filtered Air.

Cave air—lime-cave air—is considered ideal for all troubles of the throat and lungs: consumptives have, before now, tried living in caves. But the lack of sunlight and the dampness did more harm than the pure air did good. But in "Limair" one has the pure air

and the sunlight and the lack of dampness all together.

Dampness is entirely relative. A certain amount of air, at a certain temperature, will always absorb the same amount of water. This amount is stated in percentages. But a per cent. of moisture at one temperature will be different as the temperature is raised or lowered. Consequently, the humidity normal to the caves, 87 at 54 deg., reduces itself to 70 when the temperature is raised to 70 deg. In other words, when the air is expanded by raising its temperature, the moisture lessens in quantity because the quantity (bulk) of air is increased.

Some details as to the practical arrangement of this house may be interesting. The location of the house was first determined from the outside. Then a survey was run in the cave through a passageway entirely off the regular "run" for visitors, and this survey was made entirely by candle light. The survey comprised a great many twists and turns and great differences in elevation. The same distance and direction were surveyed on the outside, and a 35-foot shaft, 5 feet in diameter, was sunk. When the shaft broke through into the cave, a plumb, dropped from above, was within three inches of the corresponding stake in the cave. The shaft drops 35 feet through the hill, and the top of the chamber into which

condenser and to warm the air slightly by sunlight when desired; the lower chamber is used when it is desired to have the air reach the house just as it comes from the cave.

Frequent Changes of Air.

All the air goes to a large plenum chamber in the basement. From here it flows up through smaller shafts to the various rooms in the house. At the base of each of these smaller shafts is a steam coil, which is heated in winter time. A valve is so arranged to each ventilator shaft exit that the warm or cold air can be turned on at will. The arrangement of the entrance and exit ventilators is shown in one of the photographs. Above the top ventilator is a paper napkin, which is blown out at a right angle by the force of the air coming in. At the bottom ventilator, where the vitiated air goes out to be discharged out of doors, is a candle, the flame of which is deflected inward, showing the current of air. Although the air in the rooms changes completely in from four to six minutes, there is no draft to be felt at any time or in any place. The air flows, rather than blows.

The air is propelled into the house by a five horse-power electric motor, of which three horse-power is all that is required. It is a 42-inch fan of the disk or propeller type, with a gasoline engine in reserve in case of accident to the



The Caves from Which the Air is Drawn.

it breaks is 25 feet from the floor, so the total depth is 60 feet. The shaft house where the fan is located is 100 feet from the house, and connected thereto with the air ducts shown in the illustration. This passage is double, the top being of tin and the bottom of wood. The metal duct is used both as

current. The fan runs from 400 to 600 revolutions a minute.

Living in a house of this kind after the ordinary variety is somewhat a novel experience. The writer has been in "Limair" in both summer and winter. In winter, except for the refreshing sleep, due to more fresh air in a minute

than the usual sleeping room gets in a night, the features do not strike the casual observer until they are pointed out, but it needs no guide to show the summer visitor that something is different in this house. To come in out of a blazing sunny day with every pore a-drip with perspiration, and have to fetch a wrap in five minutes to avoid cooling off too suddenly, if overheated—to sit comfortably dressed in a temperature of 70 deg. with everything boiling outside, is a new experience.

The accompanying plans show the basement of the house, the first floor, and a section through the house and shaft reaching to the cave. These show the simple yet highly effective means employed to control the temperature and relative humidity of the air, and to distribute it and deliver it in the required volume to the various rooms in the house.

The Ventilating System.

As the air comes from the shaft it may be thrown directly to the passage leading to the house, or by means of a bypass valve be sent through a condensing chamber before it reaches the fan. It is here that the relative humidity of the air is regulated. After leaving the fan the air goes through a duct 4 by 7 feet and 105 feet long to the plenum chamber in the basement of the house. From the plenum chamber reach six different passageways for air, all below the floor level. From all of these six locations or distributing centres rise iron pipes 12 inches in diameter, and one of these pipes goes to each room in the house. These pipes are placed within large metal-lined flues. The central pipe carries the fresh air, and the flue about it carries off the vitiated air—if air which has been in a room four minutes can properly be called vitiated. The large ventilating flues continue to the attic, where they all open into a "gathering chamber," from which the air which has been throughout the house passes to the outside air again.

At the base of each pipe through which air is supplied to the rooms of the house is a mixing valve, controlled by a cord passing through the pipe to the room the pipe supplies with air. This valve controls the temperature of the air reaching a room, by determining the proportions of normal cave temperature and steamheated cave air which are to form the body of air delivered to the room. The section elevation shows this arrangement plainly: the cord is visible in the photograph showing the ventilators in a sleeping room. Of course, heat is used only in cool or cold weather, there being no necessity or desire to heat the air in summer.

Earthenware House Drains

John G. Grove, in the Plumbers' Trade Journal

By the house drain is usually meant the system of horizontal piping in the basement or cellar of a building to which the vertical stacks of soil and waste pipe are connected. Usually the house drain is of iron pipe and it then extends five or ten feet outside of the foundation wall, where it is connected to the house sewer.

No problem of plumbing construction, perhaps, has been discussed so much or has aroused such bitter controversies as the material of which the house drain should be composed. Many claim that earthenware, being practically everlasting, is the most suitable material; while

made of cement and when the interior of the hubs and the spigot ends are glazed as in commonly the case, the cement does not make a permanently water-tight junction with the pipe, consequently the joints cannot be depended upon to always remain tight.

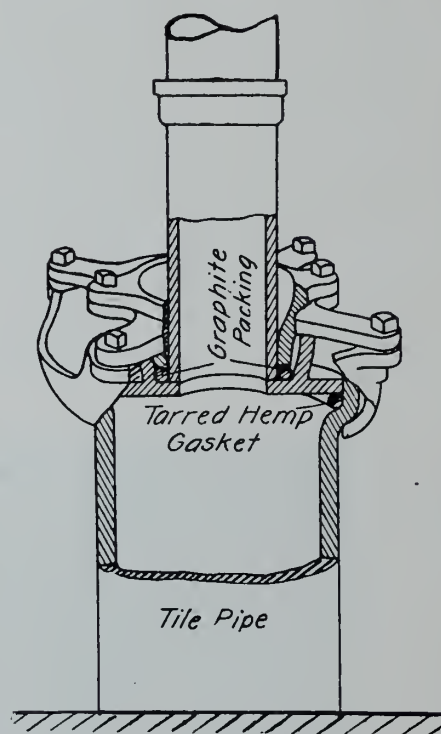
Furthermore, the material itself is very brittle and the hubs are easily broken by a settlement of the soil, and as the soil at the bottom of trenches in which pipes are laid is of a more or less loose texture, due to having been disturbed while digging the trench, it frequently happens that a line of tile sewer pipe will settle, thus not only getting out of grade, but possibly breaking some of the hubs, and at all events opening or cracking the cement at the joints. Notwithstanding the many objections to the use of earthenware pipe for a house drain, it is used to a considerable extent in cities which are not governed by plumbing laws and even in some cities which have plumbing codes the use of earthenware pipe is expressly permitted.

While under ordinary conditions, particularly on filled-in ground, the use of earthenware pipe for house drains is objectionable, there are conditions under which its use is not only permissible but is even proper. For instance, in house drains, which receive, in addition to the ordinary domestic sewage, the chemical wastes from manufacturing operations, if the chemicals are of such a nature that they would attack and destroy iron pipe it would be a better practice to install a house drain of earthenware pipe.

In this event, in order to preclude the possibility of broken joints due to settlement of the drain and to make tight under all conditions the joints between the various lengths, the entire drain should be embedded in a structure of Portland cement concrete, which will practically make of the drain a monotube structure. This form of construction can be extended not only throughout the ramifications of the horizontal portion of the drainage system, but stacks of waste pipe from the various chemical vats may also be made of earthenware pipe, embedded in cement concrete.

It may be necessary, if concrete-embedded waste pipes of earthenware are carried across ceilings or run at such angles that they will be subjected in use to severe stresses to reinforce the concrete with rods of iron, or with expanded metal, built into the concrete to provide the necessary tensile strength for the drain.

In a system of earthenware piping, such as is being considered, the various



Connections Between Earthenware Pipe and Cast Iron Stacks.

the opposition stoutly maintain that iron is the only safe material. The right opinion would seem to be that there are conditions under which tile is the more preferable material, while for ordinary conditions, cast iron is the better.

Tile pipe, as earthenware is commonly called, when thoroughly vitrified and covered over the inner and outer surface with a good coating of salt glaze, will last indefinitely when buried in the ground. The lengths, however, are very short, averaging 2 and 3 feet, which necessitates a joint at short intervals. This in itself would not be so objectionable if the joints were of such a nature that they would be as imperishable as the pipe. On the contrary, however, they are

lines of soil and waste pipes which are used to convey domestic sewage to the house drain, should be of the ordinary materials used for that purpose. One of the hardest problems in such an installation is to connect the iron pipe to the earthenware drain in a good, sanitary, water-tight manner. There is no adhesion between cement and iron so that an ordinary cement joint cannot be depended on to effect a tight joint; and even if the joint were tight at first the vibration of the stack would sooner or later shake it loose.

The connection between the earthenware pipe and cast-iron stacks in such cases must possess sufficient elasticity so they cannot easily be broken. Such a joint as this is shown in the accompanying illustration. In this connection an iron bushing is clamped down tight on a gasket of tarred hemp, which rests on the shoulder of the tile pipe socket. Resting against this bushing is the iron pipe to be joined, and the joint between the iron pipe and the bushing is made tight by means of a graphite packing.

The various conditions under which tile sewer pipe may be used, are specified in the ordinance governing the plumbing and drainage of buildings in most cities. As a rule, most plumbing codes prohibit the use of tile pipe for main house drains, within a building and many codes prohibit its use for house sewers where the sewer passes within ten feet of a well, cistern, or other source of water supply or storage. They generally prohibit its use also, when the sewer is to be laid on built-in or made ground or when the depth of the sewer is so shallow that it is liable to be heaved by frost.

ROOFS ON CITY RESERVOIRS.

Two of the largest rooms in the world, covering approximately 16 acres, and embodying building methods and material never before adapted to such a purpose, are in course of construction at Los Angeles Cal. Each is being placed on a city reservoir, one 10 acres in extent and the other 6, and reinforced concrete piers are used as supports. In the Bellevue, the smaller of the two reservoirs, these piers are 47 ft. long, and will be submerged over 40 ft. and on the other, the Ivanhoe, 27 ft. The unique work has progressed so far that the finishing touches will soon be put on.

Underground Piping for steam distribution is the title of Bulletin No. 105 issued by the American District Steam Co., Lockport N.Y., and Toronto, Ont. The book is profusely illustrated and contains suggestions and instructions of special interest to architects and engineers.

Water Hammer in a Steam Heating System

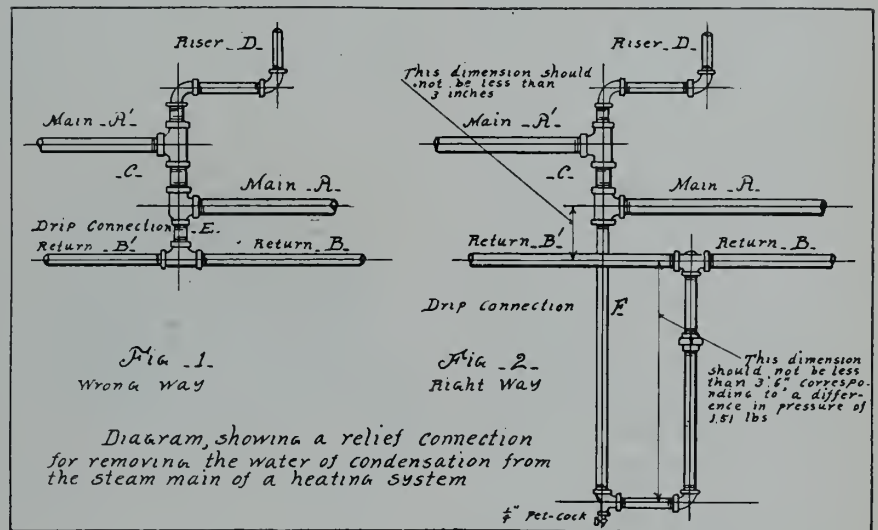
J. P. Lisk, M.E., in the Engineering Review, New York,
Describes One of the Causes of this Common Trouble.

The design of a system of piping to carry the steam to the radiators and return the water of condensation to the boiler without the noise so frequently heard, in steam heated buildings, is an easy matter for a practical heating engineer to accomplish, but is quite difficult for the ordinary steamfitter, or the man with a mere theoretical knowledge. I am not obliged to prove this statement by argument, as there are numerous installations that will speak for themselves, when fired up.

Sketch No. 1 shows a wrong method of relieving a steam main of its water of condensation, yet in practice I have met with such arrangements of piping so often that I am led to believe it is a very common fault throughout the en-

with water which will rush back flooding the receiver, causing the pump to race, and quite frequently doing itself serious damage. The reason for this action is explained as follows: A heating system is a condenser of steam. The supply pipes carry the steam to the condensing surfaces. The return pipes carry the water of condensation back to the boiler. There is a varying difference of pressure between the steam and return pipes. This difference is greatest at the points where the steam first enters the system, and where the water finally leaves it. That is at the reducing valve and the receiver of the pump, or at the outlet of the boiler, and in the return pipe near the boiler.

To be better understood, I will ex-



Water Hammer in a Steam Heating System

tire field of steam heating work. Referring to Fig. 1, A is a horizontal main supply pipe, C is a vertical riser supplying steam to a higher level through outlet D. After rising as high as the floor beams will allow, the main A' is continued on to other parts of the building. The main return pipe B and B', taking the water of condensation back to a pump receiver or to the boiler direct, have a connection, E, to the bottom of the steam main, which is intended to remove the water of condensation from this low point (the low point is made necessary by pitching the main in the direction in which the steam flows to the radiating surfaces), and return it, through the main return pipe to the receiver, or boiler, as the case may be. Right here is where the trouble begins if this connection is not properly made, and if, as I said in the beginning, it is made according to Fig. 1, it will not work satisfactorily. The system will pound and hammer, the radiator fill up

plain, for the benefit of those not entirely familiar with heating work, that the water in the return pipe of a gravity system of heating is from twelve inches to three feet higher than the water level in the boiler. This condition is brought about by the difference in pressure, caused by the steam being condensed as it gives up its heat through the radiating surfaces, thereby occupying less space in the system, consequently less pressure. This difference is greatest at the two extremes of the system, as mentioned above. Now, it will be easy to understand the trouble brought about in making a drip connection as shown by Fig. 1.

The steam entering the main through the reducing valve, or from the boiler direct, flows out until it reaches the point of relief, where it crosses over into the return pipe and feeds both ways. The water of condensation coming back through the return pipe meets an ever increasing retardant in the steam flow-

ing in the opposite direction, and as the volume of water increases the area of the steam space in the pipe decreases. The velocity of the steam increases in proportion to the contracted area through which it flows, eventually stopping the return water from flowing toward the boiler. The return water now fills the pipe, cutting off the supply of steam from the return pipe side. The steam beyond this immediately condenses forming a vacuum. The water now begins to flow, with high velocity, assisted by the pressure of steam back of it, until it meets with some obstruction such as water from the radiating surfaces forced on by the steam from the feed main or an elbow where the pipe changes direction, producing the shock called water hammer. This shock is frequently great enough to rupture the pipe and do a great deal of damage to the building. Having pointed out a very common defect in the arrangement of a piping system for steam heating, and showing the results obtained as well as giving the reason for such results, let us see how the trouble may be avoided. Looking at Fig. 2 in the diagram, we see at once how this is accomplished. Instead of making connection, E, directly, into the return pipe, B, the loop, F, is carried about 3 feet 6 inches below the level of the return pipe, as shown. This effectually prevents the steam from short circuiting into the return pipe. At the same time it allows the water of condensation to pass freely from the steam main A, and riser D, into the return pipe B, through which it passes to the receiver, or boiler.

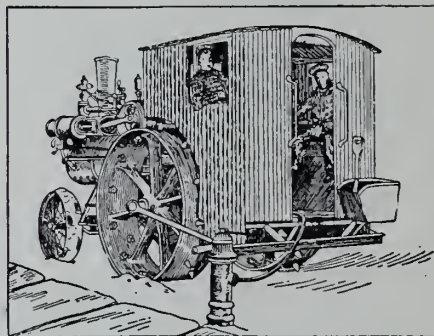
The loop, while acting as a seal, also adjusts itself to the varying inequalities of pressure in the system, due to rapid change in working conditions. I have frequently seen the temperature of a building drop 20 degrees, during extremely cold weather, within a period of fifteen minutes. Such a large variation in condition naturally subjects the heating apparatus to greater duty, which means more heat units transmitted per square foot of surface, consequently more steam from the boiler and more water going back through the return pipes and a greater difference in pressure between the two extremes of the system. If a system is properly designed, it will adjust itself to wide variation in working conditions, but if errors of construction exist, as shown by Fig. 1, and some others to be shown and discussed later, there will certainly be more noise than is agreeable. There is also the probability of having to make repairs to a leaky system.

Summed up, the cause of water hammer consists in the fact that certain parts of the system, after being filled with steam, become isolated from their

source of supply by the water that is free to move in the system, until the steam in the isolated parts is condensed leaving a vacuum, into which the water rushes until it meets with some obstruction that interrupts its movement. The intensity of the blow delivered depends on many varying conditions. It ranges however, all the way from a light shock, to a blow that ruptures pipe and fittings.

THAWING OUT HYDRANTS.

During an increased spell of cold weather a number of water mains and hydrants were frozen in our city and could not be used in case of fire. The accompanying sketch shows how W. B. Barker, Onaway, Mich., fitted my road roller with a pair of narrow faced front wheels, and with spikes in the rear rollers so he could drive it from one hydrant to another. One end of a hose was connected to a steam pipe inside the cab and the other end run



Thawing City Hydrants

into the stand pipe of the hydrant. The work was accomplished quick and with success.—Popular Mechanics.

FAVORS PROVINCIAL LAW.

Harry Mahoney, Guelph, called at the Toronto office of Plumber and Steamfitter on May 25, on his return from an enjoyable fishing trip to Sparrow Lake, near Gravenhurst, along with Wm. Mansell, of the Purdy-Mansell Co., Toronto, and other friends.

Mr. Mahoney is a strong advocate of a provincial law governing plumbing work throughout Ontario, the law aiming to protect the public from unsanitary work by making all doing plumbing work subject to provincial examination and inspection. As an instance of the need of provincial regulations of this kind, Mr. Mahoney told of a hotel job in a small town north of Guelph where he was called in. An amateur

had connected up a boiler to a range in a way that it couldn't do its work, while no traps were used on the plumbing fixtures installed.

The owner of a building should be protected against unsanitary work. He cannot be expected to know the intricacies of good and bad plumbing work and when he decides to spend money on installing sanitary appliances, he should have some assurance that the work will be done properly. This can only be done in the country towns by having the Provincial Government take action. The regulations adopted should be simple, aimed merely to protect the public and ensure good work on the part of plumbers working under provincial regulation. The details of by-laws can be safely left to each municipality after the province has adopted certain underlying principles governing the work generally.

BOILER SCALE PREVENTER.

A new method of preventing scale in boilers has been invented by F. Brunn, a Russian engineer; it consists in adding a small quantity of linseed to the boiler water. The apparatus, as described in *Technicheskyy Wyestnik*, consists of a copper tank divided into two parts by a fine-meshed horizontal sieve. In the upper part is put a quantity of linseed, and this part is connected with the hot water supply. The resulting decoction filters through the close-meshed double copper sieve to the lower part, from where it is fed to the boiler through the injector.

The slimy substance of the solution attacks every particle of the forming scale which does not adhere to the walls of the boilers, and is readily ejected when the boiler is blown out. Even should this mass settle upon the walls, it forms a porous, spongy substance, easily cleaned off. Experiments made at a number of government and other power plants in Russia have all given satisfactory results. New boilers were kept free from scale, and old boilers were gradually cleansed.

The necessary quantity of linseed is about half a pound for every 100 horse-power. Taking 30 pounds of steam as equivalent to one horse-power, the quantity works out at about half a pound of linseed for every 270 gallons of feed water.

The apparatus being merely a divided copper tank with connections to the boiler, has the advantage of great simplicity of construction. It seldom needs any more repairs other than an occasional cleaning of the sieves, and the expenses of running it are very small.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

VENTING WATER CLOSETS.

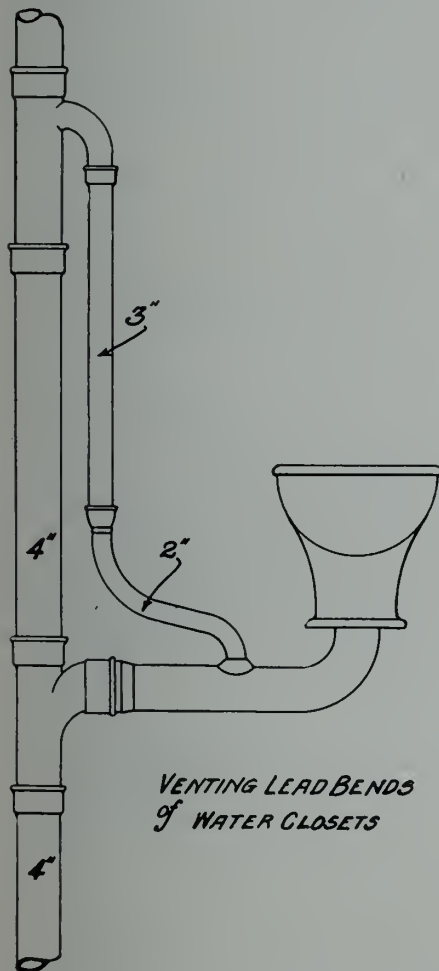
Editor Plumber and Steamfitter,—There is a subject on which I would like to get some information, and I think there are other plumbers also who would like to see it discussed.

What is the use of running a two-inch vent on to a closet bend where the closet is only ten or twelve inches from the stack? Some plumbers do it different from the way I have shown it (our correspondent shows a sketch with the vent on the side (?) of the bend) by bringing the vent off the top of the bend (as shown in drawing). This, I think, is a part of our by-law which many down

would be pleased to have our readers discuss it through these columns.

If the bend is to be vented it should be vented from the top and not the side. Many cities specially provide in their by-laws that closets within two feet of the stack need not be vented, where no other waste pipe connects with the soil pipe at a point higher than the connection of the closet.

In Washington, D.C., where the plumbing regulations have been brought fairly up-to-date, and where the work is under the direction and supervision of a Plumbing Division, a closet may be located within two feet of a stack without vent if it is a top or only fixture and in case of one closet, the stack need not be over three inches. In The Plumber and Steamfitter of May 20, 1908, on the two page illustration showing system of house plumbing in the District of Columbia, this point is clearly illustrated. Let us hear from other readers on the point our correspondent raises.



here think is of no use whatever when the closet is placed so close to the stack. Now, of course, I am only passing my opinion when I say that although it is not as good looking a job when taken off the top as when taken off the side; it is the only way this useless piece of work should be done. What is the use of putting a two-inch vent on when the stack is only twelve inches away? This is something on which I would like to read some discussion.

E. F. R.

Peterboro, May 17.

Our correspondent opens up a very interesting subject of discussion and we

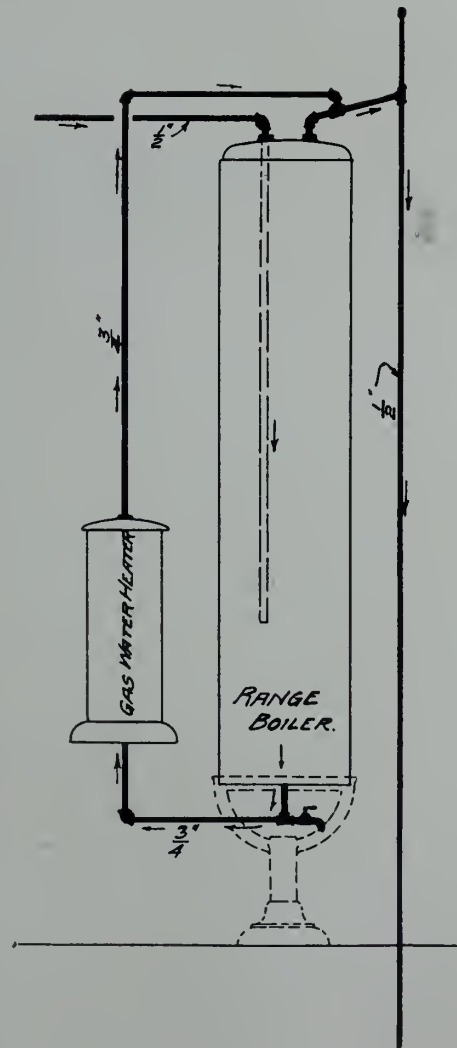


Fig. 1.

GAS WATER- HEATER CONNECTION

Gas water-heaters for the domestic supply of hot water are coming into more universal use every day. They form a simple, quick, efficient and cheap means of heating moderate quantities of hot water at any hour of the day or night.

Notwithstanding their simplicity, it is sometimes found they do not give the service they should, but this is most always attributable to some faulty connection to the range boiler to which they are attached. A faulty connection where the best results cannot be had is shown in Fig. 1.

The proper method of making the connections and the arrangement and

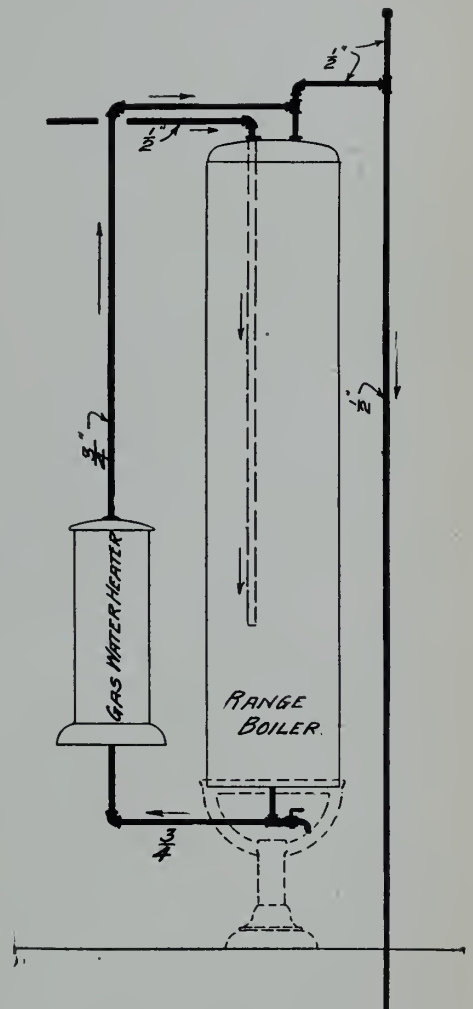


Fig. 2.

the location of the heater, where the gas water-heater only is attached to the boiler is shown in Fig. 2.

It is to be noted that the hot water supply is taken off at a point higher than the connection from the heater, and that the circulating pipes at any point between the heater and the range boiler should not be less than $\frac{3}{4}$ of an inch.

A simple observance of the method shown for the connections will insure successful working of the heater.

NEWS OF THE TRADE IN CANADA

A. T. State & Co., plumbers, Montreal, have assigned.

Findleton & Russell, plumbers, Montreal, have been registered.

Noble & Rich have the plumbing contract for London's new isolation hospital.

Fred Smith, master plumber, Guelph, left on Thursday on a holiday trip to England.

Chas. W. Powell, Arnprior, Ont., has engaged in the plumbing business on his own account.

An effort will be made to reorganize the Canadian Brass Mfg. Co., Galt, which assigned recently.

The Natural Gas Supplies Co., Montreal and Three Rivers, Que., has been granted a winding-up order.

George E. B. Grinyer, late of Georgetown, Ont., has opened a plumbing and steamfitting business in Guelph.

A. Bryd Woods, plumber, Lindsay, Ont., died on May 3, after seven weeks illness with apoplexy and meningitis.

Bennett & Wright, Toronto, have the \$5,000 plumbing and heating contract for Edmonton's (Alta.) new post office.

Stearns, Haney & Pringle, tinware, stoves, etc., Dunnville, Ont., are succeeded in business by Haney & Pringle.

Elford & Cornish, plumbers, Saskatoon, Sask., have fitted up the front part of their premises as a showroom.

W. J. Hurst, a Toronto plumber, choked and died almost immediately while eating his evening meal on May 19.

George Ross, Brockville, has secured the contract for installing heating systems in the Kemptville high and public schools.

Peter Ogilvie, of Montreal, has been on a business trip to Cacouna, Que., doing extensive alterations to various houses there.

S. Skelly has the plumbing and the Smith Plumbing Co. has the heating contracts for the Lorne Avenue school, London, Ont.

H. T. Bush, president of the Standard Ideal Manufacturing Company, Port Hope, spent several days in Toronto during race week.

John Bugg & Son, Wingham, have sold their stove, plumbing and tinsmithing business to W. J. Boyce, London, who will continue the business.

Elliott Bros., Kingston, Ont., have the contract for the plumbing work at Petawawa camp. It will take about two months to complete the work.

M. J. Quinn, of Cluff Bros., Toronto, has returned from a business trip to Winnipeg. He reports business conditions in the west to be brightening.

E. P. Paulin has joined with W. R. Pinder in the plumbing, tinsmithing and stove business at Goderich, Ont. The

concern will be known as Pinder and Paulin.

G. & E. Blake, St. John, N.B., have the contract for the heating and plumbing in the Bank of New Brunswick building being erected there. F. E. Jones has the electric lighting.

M. J. Barr, of Barr & Anderson, plumbers, Vancouver, is on a trip to Chicago, Toronto and other eastern points, on business connected with the firm's numerous large contracts.

Geo. M. Watt, son of John Watt, Guelph, Ont., has resigned his position with the Dominion Radiator Co., Toronto, to take a position with the drafting department of Cluff Bros., Toronto.

The Montreal Master Plumbers have been able to retain their old hall on St. James Street after all. It was thought probable that the premises would be wanted for alterations, but the association has been able to retain the rooms for another year.

Harry Buchan, who has been employed for some time past at Stevenson & Malcolm's plumbing shop, Guelph, Ont., left last week for Fort William, where he has accepted a position with the Higginbotham Plumbing Co. Harry will be greatly missed at Guelph, as he has taken a very active part in sporting circles.

John Watson, Montreal, president of the National Master Plumbers' Association, states that in all probability the next convention will be held in Quebec during the Tercentenary celebration. Mr. Watson has visited Quebec in the matter, and made inquiries as to rates and hotel accommodation. He is waiting certain definite replies from Quebec before anything further can be done.

L. B. Peebles, manager of the Tacoma and Seattle branches of the Crane Company, which recently bought out Boyd, Burns & Company's plumbing and steamfitting supplies, Vancouver, B.C., recently visited that city accompanied by Thomas Nau, purchasing agent for the company on the Pacific Coast. Crane & Co. will take possession on July 1st, and a portion of the extensive improvements to the building will be the addition of two storeys.

A low pressure gravity and vacuum heating plant has been installed in Bowring Brothers' department store, St. Johns, Newfoundland. The plant has been extended to the office, dry goods, grocery and hardware departments. The boiler was manufactured by Richardson & Boynton Co., of New York. The plant includes the ordinary radiator used in the installation of modern steam heating. The heating of each flat or department is self-controlled, while the whole system is controlled from the boiler-room in the

basement. The piping is so arranged that the building is heated from the vapor in the boiler, and is so adjusted that the radiator that is farthest away, (in this instance 160 feet) is the same temperature at any time as the one nearest the boiler. It has been the custom to have work of this kind planned outside of St. John's, but in the present instance the whole of the laying out and the installation has been done by the firm of Moore & Co. The plant is giving the utmost satisfaction.

PLUMBERS DO GOOD FISHING.

H. T. Bush, president, C. E. Sherriff, and W. J. Linton, of the Standard Ideal Manufacturing Company, Port Hope, on May 20 and 21, entertained George Clapperton, of Bennett & Wright, Harry Hogarth, of Fiddes & Hogarth, and Walter Benson, three Toronto master plumbers, on a trout fishing trip to one of the lakes north of Port Hope.

The trip was made in rainy weather but no party of fishers, and plumbers at that, would be afraid of leaky clouds. To get wet is as much the aim of most fishermen as to catch fish, and this crowd were no exceptions to the rule, as they accomplished both objects, 126 fine large trout being caught in four hours as well as a few logs secured by Messrs. Sherriff and Benson. The "House of Commons" brand of bait is understood to have proved the most successful. A day was spent by the party in looking over the recently enlarged enamelware plant and new soil pipe foundry at Port Hope, the complete process of manufacturing enameled baths, sinks, basins, range closets, etc., being explained to the visitors by Mr. Bush.

Another feature of the trip was the remarkable luck of Harry Hogarth in holding numberless lone hands in friendly games of euchre. Between fish yarns and card stories he now has a goodly supply of talk to hand out to the boys for a long time to come.

ARTICLES FOR NEXT ISSUE.

Owing to being received too late for publication in this issue the article promised by Mr. George Clapperton on the serviceability and comparative cost of iron pipe and tile for inside house drains will be held over until our next issue.

In our next issue we will also publish an article by Mr. M. J. Quinn on the septic tank method of disposal of house sewerage, which has been revised up to date. The whole subject will be dealt with in such an explicit, clear manner that no person interested can fail to grasp the full meaning of the various points discussed.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

Richmond, Que., may build a \$6,000 school.

Dundas, Ont., will build a \$12,000 High school.

Whitewood, Sask., will build a \$15,000 school.

A new \$15,000 town hall is proposed for Meaford.

North Toronto may erect a \$5,000 fire hall.

A \$25,000 theatre will be built at Brantford, Ont.

Kildonan, Man., will build a new \$6,000 public school.

A \$5,000 fire station will be built at Glace Bay, N.S.

A new public school will be erected in St. John, N.B.

A technical school to cost \$75,000 will be built at Hamilton.

Alberta's new \$200,000 asylum will be erected at Ponoka.

A \$20,000 Presbyterian church will be erected at Banff, Alta.

Fort William will spend about \$70,000 on its schools.

A \$44,000 Catholic church and rectory may be erected in Montreal.

Contracts have been let for the new \$50,000 hospital at London.

Tenders are called for a new school building at Francis, Sask.

A new \$22,800 public bath building will be erected in Montreal.

A new Anglican church is being erected in Hastings, Ont., this year.

Wellington Street Methodists, London, will erect a \$10,000 Sunday School.

Rosthern, Sask., will spend \$25,000 on building and furnishing a town hall.

Tenders are called for the erection of Edmonton's new \$200,000 court house.

Brandon's new armory, to be completed in the fall, will cost \$65,000.

A new \$20,000 school will be built in Woodstock, Ont., to replace Delatre St. school.

S. Brown, Vermilion, Alta., has the contract for Vermilion's new \$28,000 school.

Work on Edmonton's new \$200,000 court house will begin about the middle of June.

The new \$125,000 Church of England cathedral at Halifax, N.S., is under contract.

The Supreme Court building at Halifax, N.S., is having a \$25,000 addition constructed.

The new \$300,000 Catholic cathedral at St. Boniface, Man., will be finished by the fall.

A new municipal building and opera house, to cost \$175,000, is proposed for Port Arthur.

Abel Hendron, Lakefield, Ont., has the contract for the new Methodist church there.

Additions will be made to two Vancouver schools and a new one will also be built there.

A new \$20,000 school is proposed to be built as an addition to the Boys' Home, Toronto.

A new municipal building and opera house, to cost \$175,000, is proposed for Port Arthur, Ont.

St. Joseph's Catholic church, Winnipeg, recently burned, will be repaired at a cost of \$12,000.

Since the beginning of the present year, fifty building permits have been taken out in Peterboro.

Faulkner & McDonald, Sydney, C.B., have the contract for the new \$110,000 Technical College at Halifax, N.S.

The Vancouver, B.C., school board is asking the city council for \$160,000 to improve the present school buildings.

The contract has been let for the erection of a new court house at Moose Jaw, Sask., and operations on the foundation have already commenced.

St. Mary's congregation, Summerside, P.E.I., will erect a new church, to replace the one burned a year ago, and tenders are called for its construction.

Calgary's new public buildings this year will include a \$90,000 Government registry office, completion of the \$200,000 normal school, and the bulk of the work on the new city hall.

Water and Sewage Systems.

Waterloo will spend \$5,000 on waterworks extensions.

Vancouver may spend \$300,000 on a waterworks system.

Work on the sewerage extensions in Vancouver has begun.

A sewerage system may be installed at Bridgeburg, Ont.

Montreal will spend about \$50,000 on waterworks improvements.

Cobalt contemplates constructing a waterworks and sewage system.

A number of sewer extensions will be made in Perth, Ont., this year.

A waterworks system to cost \$5,000 may be installed at Melbourne, Que., Glace Bay, N.S., ratepayers have voted \$30,000 for water service extensions.

Ville Marie, Que., desire to spend \$27,000 on waterworks and sewage systems.

Woodstock's (Ont.) board of health asks for sewers on two streets in that city.

Yorkton's (Sask.) new waterworks system is expected to be in operation soon.

The \$345,000 water gravity system for Calgary, Alta., will be constructed this year.

London ratepayers will on June 22 vote on the \$560,000 new water scheme.

Some \$65,000 will be spent on Prince Albert's (Sask.) sewerage and waterworks systems.

A filtration plant is proposed for Brampton, Ont., in connection with that town's sewerage scheme.

Port Stanley, Ont., ratepayers will on June 15 vote on a by-law to construct a \$17,000 waterworks system.

Winnipeg wishes to submit a by-law authorizing the expenditure of \$50,000 for placing wires underground.

Montreal is asking for tenders for the purchase of accumulators for the waterworks pumps at Point St. Charles.

The municipality of Richmond, B.C., is asking for an extension of Vancouver's waterworks system to that district.

New water mains will be laid on St. Catherine Street, Montreal, and a number of small-pipe water services will be enlarged.

Victoria, B.C., is advertising for tenders for the supply of steel-riveted pipe and for two electric-driven power pumps for its waterworks system.

Willis Chipman, civil engineer, Toronto, is to make a report on the best system of waterworks and sewerage to install in the town of Dauphin, Man.

Tenders have been closed for the laying of water pipes in connection with Sherbrooke's waterworks system. The expenditure is expected to be in the vicinity of \$150,000.

Only two by-laws will be submitted to Toronto ratepayers on June 27, and these are to provide \$240,000 for sewage disposal purposes and \$750,000 for a water filtration system.

Calgary, Alta., ratepayers have endorsed by-laws calling for \$175,000 being spent on waterworks extensions; \$44,000 for construction of trunk sewers, etc., and \$14,000 for the construction and equipment of a refuse destructor.

General Building Notes.

The Bank of Montreal is erecting a branch building in Charlottetown, P. E. I.

Tenders are called for a \$20,000 hotel to be built at Ville Marie, Pontiac County, Que.

Tenders are called by S. Carter, Guelph, Ont., for the erection of a \$10,000 concrete block of stores.

Extensive additions are planned for the C.P.R. hotel at Banff, and a large dance hall is being built on the Sanitarium grounds.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, June 1.—Plumbers generally are busy, and in consequence a brighter tone is observable all the way round. The supply houses report a good volume of trade going out, and orders which were on the light side are becoming much heavier in bulk. The building trade has developed splendidly in the last two or so, and the permit department for Montreal has been very busy. The larger buildings are on the light side, but there is no decrease in residential property. In the suburbs the greatest activity is noticeable, and in every direction foundations are being laid and walls erected with the utmost rapidity. The dispute between the bricklayers and the contractors is now practically at an end. Both sides have claimed the victory, but the plumber is not concerned very much on the point. He is quite content to know that building operations will not be interfered with, and that plenty of work will, therefore, be coming to him right through the summer.

Quite an exceptional number of contracts in outside cities have been accepted by Montreal plumbers. In Winnipeg, Ottawa, Quebec and many smaller towns in the Province of Quebec local work will be done this summer, and this shows how progressive the Montreal industry has become, and how the reputation of the various shops for good work is being generally recognized. Some good contracts in the city have also been closed but as we have said, there is a falling off in the larger building, although this is made up by the work to be done outside and the growing demand so far as residential houses are concerned.

Prices are generally firm, and stocks, in consequence of the somewhat light demand in the past, are all in good shape. Manufacturers and jobbers are in a good position to ship promptly, and there is nothing to interfere with a good season from now onwards. Confidence is much more general than it was, and prospects now look bright and healthy.

Iron Pipe—During the last two weeks some good sized orders have been shipped and there seems a more general desire now on the part of users to book ahead. We continue to quote: $\frac{1}{2}$ and $\frac{3}{4}$ pipe at \$2.03 and \$2.25 for black, and \$2.86 and \$3.08 for galvanized.

Soil Pipe—With the activity in the building trade increased business is being done. Good orders have been received, and much better bulk is moving. Inquiries seem to show that users' stocks are generally light. We quote: Light, 3 to 6 inch, 60 off; medium and heavy, 2 to 6 inch, 70 off; 8 inch, heavy, 40 off.

Lead Pipe—Business has been greatly stimulated, and users seem to be booking much further ahead than they did. This is probably owing to the recent reduction in price, and the feeling

that plenty of material will be wanted this summer. We quote pipe and waste at 30 per cent.

Solder—The demand has improved, somewhat owing to stocks becoming depleted in the various shops. Roofing operations are fairly extensive and there is, in consequence, a heavy drain on supplies. Prices are unchanged.

Enamelware—Trade is looking up, and some fair orders have been received by the supply houses. Inquiries are well to the point, and good business seems to be probable very shortly. Prices are unchanged.

Brass Goods—Business continues to improve. The call for cheap goods does not seem quite so strong as it was and standard lines are going better. We continue to quote compression work at 65 per cent. and fuller work at 70 per cent.

Radiators and Boilers—Orders are much more encouraging than they were, and prospects have brightened with the stimulation in the building trade. Radiators are quoted at 52 $\frac{1}{2}$ off. Boilers are unchanged. Steamfittings are moving ahead with other lines. No change in discounts.

Metal—Tin continues to fall in the primary markets and prices have been marked down. Copper and spelter are firmer. We quote: Ingot copper \$14.50; ingot tin, \$33; lead, \$3.70; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10 $\frac{1}{2}$ c; light copper, 10c; heavy lead, 2 $\frac{1}{2}$ c.

TORONTO.

Toronto, June 1.—There has been quite an improvement in trade during the past fortnight, particularly in the city, and the future seems bright and especially is this so now that building permits are increasing from week to week. Roughing-in is being largely done and some of the master plumbers have their hands full of more advanced work.

Radiation has increased two cents per square foot in price, which is about a 5 per cent. advance.

Iron Pipe—Orders continue small, although a goodly number of them are being received. The stocks on hand are fair—sufficient to meet present demands. Prices are the same as quoted a fortnight ago and there does not appear to be a likelihood of any change in the immediate future, at least. One-inch galvanized is quoted at \$6.93, and one-inch black at \$5.28. Cast iron fittings remain at 65 and malleable fittings at 35 per cent.

Soil Pipe—Light pipe is still quoted at 60, and fittings at 70 per cent. Medium and extra heavy pipe and fittings remain at 70 per cent. Quite a little soil pipe is going out, mostly for work in the city. Future prospects are good.

Lead Pipe—Fair, though small, orders are still coming in, and both supply and demand are about the average. Prices remain unchanged, pipe and waste being still at 30 per cent. and traps and bends from 50 to 60 per cent. Caulking lead is at 4 $\frac{1}{2}$ per cent.

Solder—Like lead pipe, a fair business at unchanged prices is being done. Wiping solder is quoted at 18c, with 19c asked for half-and-half.

Brass Goods—This line is very quiet just now and men in the trade do not look for a change before a month yet. Fuller work continues at 70 and compression work at 65 per cent.

Enamelware—A good trade is being done in this line and business seems to be as good as a year ago. Prices continue unchanged, although there may be a slight change before the present month ends.

Boilers and Radiators—A fairly brisk business continues in this line of heating goods, and dealers are satisfied with things as they are, considering the state of the market generally. There is an increase of two cents per square foot, a 5 per cent. advance in the price of three, four and five-bar radiators. Angle radiators are now \$5 per angle extra, and a number of listed items are changed, though the discount remains the same.

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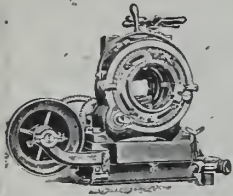
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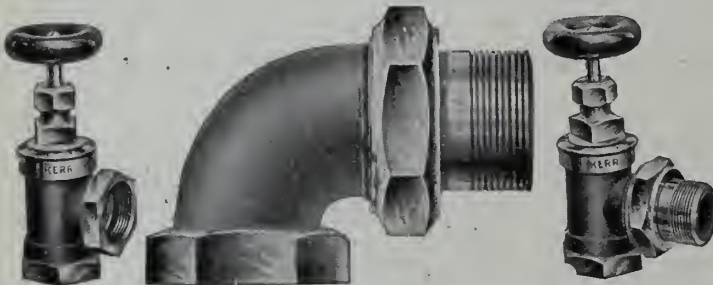
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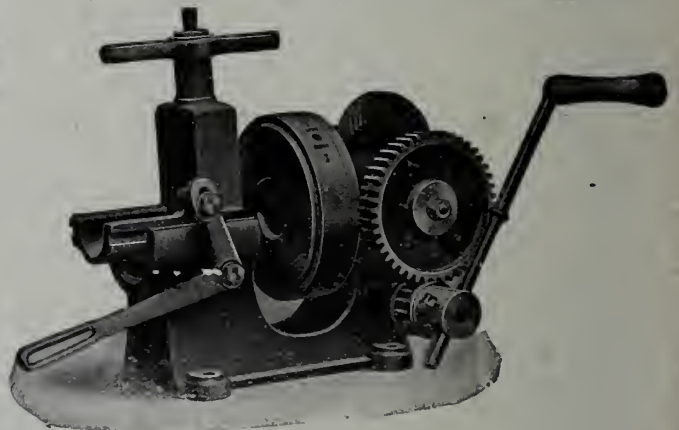
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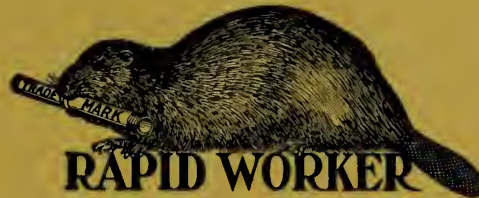
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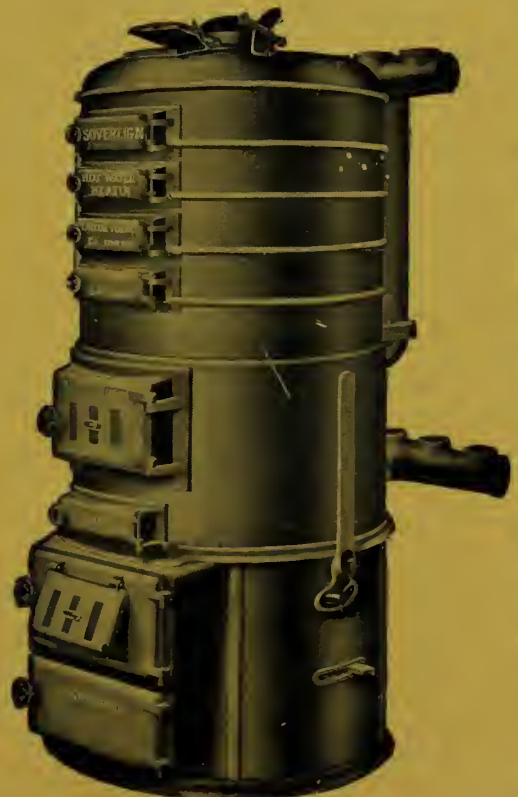
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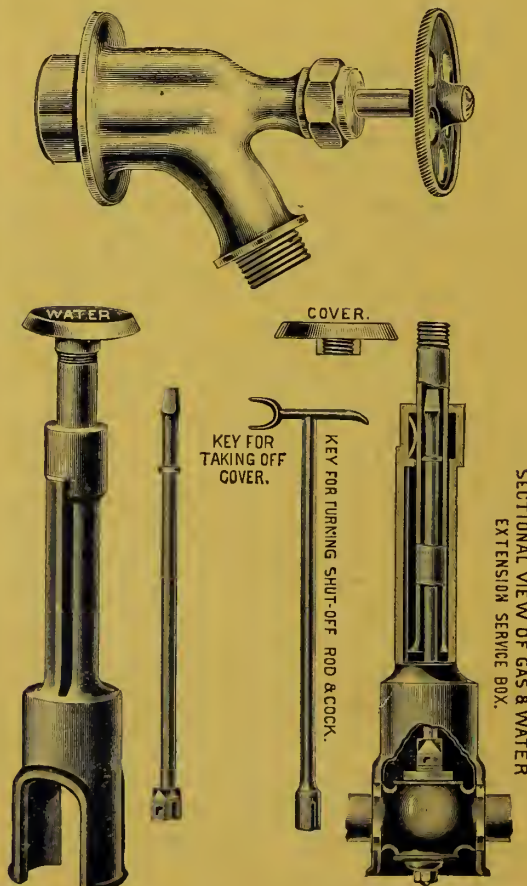
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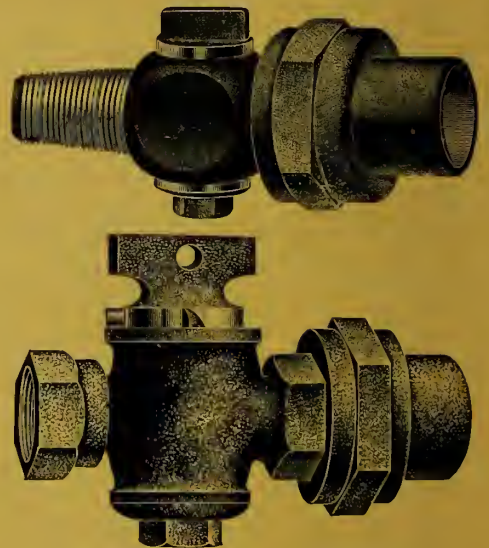
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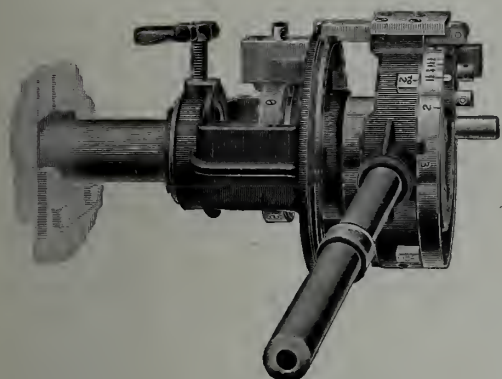
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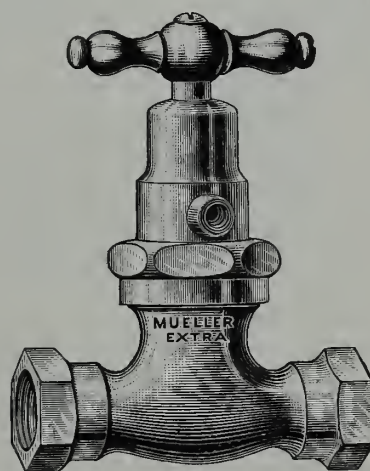
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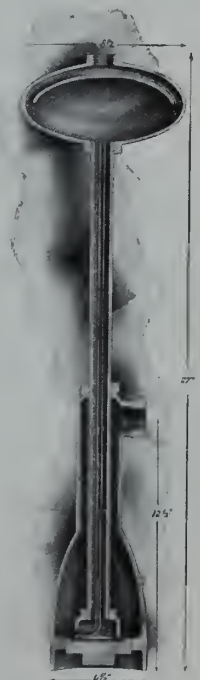
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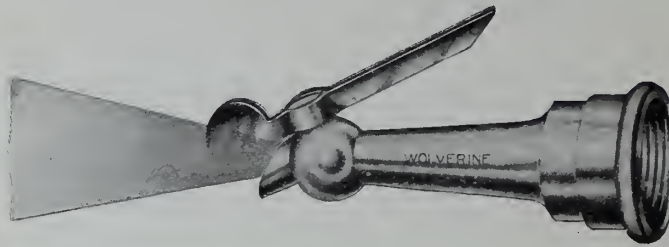
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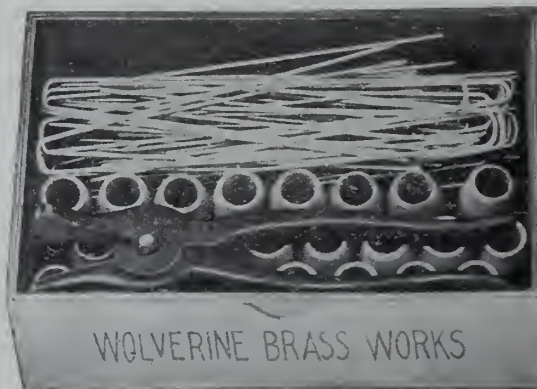


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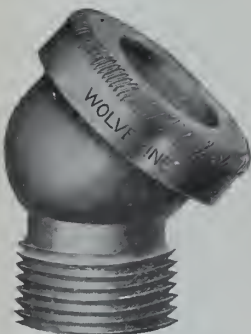
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James Robertson Co.,

MONTREAL—TORONTO—WINNIPEG ST. JOHN—VANCOUVER

Limited

Plumber and Steamfitter and Sanitary Engineer of Canada

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MONTREAL, TORONTO AND WINNIPEG, JUNE 15, 1908

PROVINCIAL REGULATIONS NECESSARY.

The need for Provincial regulations governing plumbing work has been referred to before by The Plumber and Steamfitter, and it is to be hoped that some action is taken before long to draft such a code of requirements. A Provincial Association of Master Plumbers could do good work in this direction, but such an organization is not yet in existence.

In the suburbs in the beach districts outside of Toronto plumbing work is entirely unregulated and systems are installed without maintraps and without fixtures being vented, traps to fixtures being thus rendered worthless and sewer gas from cesspools or septic tanks being allowed to enter the house and breed disease injurious to the house tenants and the community.

Readers of The Plumber and Steamfitter are requested to supply the editor with information showing the need of Provincial regulations. Let a mass of evidence be gathered so that regulations will be prepared compelling incompetents and unscrupulous plumbers to do good work or get out of the business.

The plumbing trade has suffered too long from the ill-effects of such work, and it is time that the good reputation of the trade is regained.

DOCTORS RECOGNIZE PLUMBERS' WORK.

In a valuable paper read before the Canadian Medical Association last week, by the President, Dr. F. Montizambert, of Ottawa, the necessity and duty of Government regulation and inspection of sanitary work was made very clear. His address met with the highest commendation for the valuable suggestions made. Adequate protection of the public in their health and the diffusion of more information regarding preventative measures received the principal attention.

It was pointed out that public education along these lines must be undertaken, and the importance of safeguarding the public health brought home to every individual. The speaker further suggested that a council of public health be created to advise the Government.

The necessity of good plumbing was clearly brought out and it was stated that defective plumbing developed many contagious diseases and Governmental regulation and inspection was advisable. "The plumber," the Doctor said, "has more to do with the health of the average home than the doctor."

As has been said before in these columns, the doctor has to deal with the disease after the disease has been created, but the plumber and sanitary engineer deals with the equipment that is the greatest preventative of disease. To him the public must naturally look for the greatest betterment of sanitary conditions. The higher is raised the plane of the work the better will be met the need of this most important field of operation, and the better will be discharged this duty to the public.

Through association work along correct lines and conferring with his fellow man in the same line of work, and the counselling and encouragement of reasonable sanitary requirements and regulations the plumber can be of the greatest good to the public and to himself.

The public demands better sanitary conditions to-day, and it is only through the best work of the plumber that such conditions can be realized. There is no one else to look to and the plumber should place himself at once in the position to give and receive the benefit of these conditions.

Plumbers who have felt that the importance of their work was not recognized will be gratified to note the high appreciation of the importance of the plumbers' work so fully set forth by Dr. Montizambert at the meeting of the Canadian Medical Association. The wide dissemination of information through Boards of Health and the press is having a most beneficial effect.

The Michigan State Department of Health issues quarterly a brochure dealing with the methods of heating, ventilation and sanitation, and is accomplishing much good there.

Chicago authorities attribute much of their success in the administration of the health department to the co-operation of the Chicago newspapers. Weekly talks to the public on preventative measures and health rules and regulations are published every Monday.

Dr. Joseph F. Neff, Director of Health and Charities, Philadelphia, Pa., expects to follow a similar line, and in an interview published in the Philadelphia Public Ledger last week, said: "The newspapers will bring our health department close to the people, and with the intelligent basis thereby established, the public, instead of obstructing, will co-operate with us in safeguarding the health of the community."

Dr. W. E. Evans, Commissioner of Health at Chicago, is an old newspaper man and well knew when he assumed office that he could have no greater aid in carrying out public health measures than the newspapers offered. He has a regular publishing bureau, which issues short,

snappy articles teaching the gospel of ventilation as a first principle and preventative medicine that the simplest rules of hygiene make effective.

In Canada exists to-day the same field for this great co-operative work among the plumbers, sanitary engineers, doctors, the public, the newspapers and Bureaus of Health. Co-operation will accomplish much good to all.

HOLD CONVENTION AT TORONTO.

Last year's convention of the National Master Plumbers' Association at Montreal decided that the 1908 gathering should be at Toronto or some Ontario city. The holding of the Tercenary Celebration at Quebec, however, induced the Executive Committee to look into the possibilities of having the convention held at the Ancient Capital. Difficulty is being experienced, however, in making the desired arrangements and the Executive will meet this week to again consider the matter.

The convention should be held at Toronto, Guelph, Hamilton or London, as originally intended. The time is ripe for re-organization in Ontario, and the trade in Toronto has already prepared plans for re-organization along lines which it is felt will be of great benefit to the trade and general public, and entirely unobjectionable from a legal standpoint. The holding of the convention at Toronto at the present time would be decidedly opportune and do much to again bring together the trade in both city and Province.

It is generally agreed that a reorganization along old lines with price agreements as a basis, would be unfortunate and bound to result in disaster sooner or later. On the other hand, an educational organization, with discussions on trade subjects as the attracting force, would soon attract a large membership, and unite the trade on a basis of intelligent fellowship. Bring the master plumbers together, provide a programme of a series of instructive talks on trade subjects, improvements required in plumbing regulations, discussions on methods of managing a business and figuring on contracts, and in a year's time the ill-feeling resulting from the price-cutting of the past couple of years will die out and prices will gradually revert back to a plane where a living margin of profit can be secured, and, being natural rather than artificial, the organization will endure.

The above applies not only to Toronto, but to all the large centres in Ontario, and as Ontario is the pivot on which a truly national organization must swing, a re-organization in Ontario will benefit the trade in all parts of Canada.

Toronto is the logical meeting place for 1908, and though time is short an announcement of the selection of Toronto, made in the next issue of *The Plumber and Steamfitter*, should lead to a large attendance at the convention and the completion of a local organization to look after the entertainment of the visitors.

PLUMBING LAWS AND PLUMBING PROGRESS.

The value of laws regulating plumbing is held in varying degrees of esteem by different observers of their effect. All seem to agree however, that wide and general benefit has accrued from laws and regulations requiring the installation of plumbing equipment to be done in a manner demonstrated to be in the interest of public health. There are evidences all through the country that men who are thoroughly acquainted with the requirements, the best methods of meeting them, and who are masters of the theories and principles bearing upon the disposal of household wastes are capable of improv-

ing on the lawful requirements, both in the matter of service and in sanitary efficiency, to say nothing of the simplification of the work and reduction in its cost. It is pointed out that wherever such men are compelled to work under regulations they are prohibited from doing work in a manner which their experience and judgment demonstrates to be more desirable from every point of view.

There is no question that some of the details of plumbing regulations have been arbitrarily settled and that there is nevertheless room for an intelligent difference of opinion, yet the law prevents what advanced sanitarians consider progress. Without going to the extreme of some who would eliminate important fixtures and depart from established practice, there is ample evidence that decided changes could be made in the method of installing house drainage systems that would be attended with advantage, but which advancement is not practiced, as it is impossible in view of the rigid regulations which are widely in force.

Close observers have pointed out that the Eastern cities, where regulations are oldest and followed more closely, show by no means the degree of advancement in methods of installation and equipment that are to be found in the West where the thinking sanitarian is not hampered by positive restrictions as to the manner in which work shall be done. There is much for thought in the point raised by these students of the methods in different sections that is well worth consideration, and, says the *Metal Worker*, it is possible that when the report of the Sanitary Committee of the National Association of Master Plumbers is finally made public it may contain recommendation as well as information regarding changes in what has been considered the best method of arranging plumbing systems.

COURTESY PAYS.

If there is one man on earth more than all others that the plumber cannot afford to offend it is the drummer, providing, of course, the latter is a man who knows his place and keeps it; if not his influence is nil and he will soon cease to be a drummer.

Aside from the value of the commercial man as a trade barometer and a source of information on new goods, he has more influence with every branch of the trade in a day than the local plumber has in a life time. How easy then it is for him, consciously or otherwise, to communicate elsewhere certain personal impressions, and, of course, these would be most likely to come to mind at the places where they would be of the most interest, and where they would consequently do the most good or harm.

Politeness is always a profitable quality, but lack of courtesy to the commercial man may be considered almost in the nature of a calamity if he chooses to resent the mistreatment and use his power. Take it as a rule, the plumber who is prompt in meeting his bills and who stands in well with the commercial men has a pretty good stand-in with the entire trade so far as it is ever likely to affect his own business.

COMING CONVENTIONS.

National Association Master Plumbers (also Master Steamfitters' Association), Boston, Mass., June 14 to 18.

American Society of Heating and Ventilating Engineers, Niagara Falls, N.Y., July 24 and 25.

Canadian National Master Plumbers' Association, probably at Toronto, about August 1.

Plumbing By-laws in Different Cities

A Continuation of the Comparison of the Toronto and St. Louis Printed Requirements Begun in the June 1 Issue—
Montreal's Plumbing Requirements—Iron Pipe Better Than Tile for Drains—Department of
Public Health Suggested.

Safe Wastes.

St. Louis (Sec. 1611) : Drip or overflow pipes from safes under water closets or other fixtures, or from tanks or cisterns, shall be run to some place in open sight, and in no case shall any such pipe be connected directly with a drain, waste or soil pipe. Waste pipes from refrigerators or other receptacles in which provisions are stored, shall not be connected with drain, soil, or other waste pipe unless such waste pipes are furnished with traps, suitably ventilated, and in every case there shall be an open tray between the trap and refrigerator.

Toronto (Paragraphs 14 and 16) : No safe waste, range-boiler or cistern overflow shall be allowed to connect direct with any drain. Refrigerator wastes shall be supplied with properly ventilated traps, and be disconnected and have drip basins when necessary.

Grease Trap.

St. Louis (Sec. 1611) : A grease trap shall be constructed under the sink of every hotel, eating house, restaurant, or other public cooking establishment

Toronto : No reference.

Prohibited Sewage Material.

St. Louis (Sec. 1611) : No person shall deposit or throw in any sewer, or sewer inlet, or into any private drain connecting with a public or district sewer, any straw, hay, shavings, tinners' scrap, waste produce or material of manufacture, manure, rags or garbage, or any substance which may cause the sewer or sewer inlet to choke up, or which may cause a nuisance.

Toronto : No specific reference.

Packing Houses and Dairies.

St. Louis (Sec. 1611) : No packing house, slaughter house, lard rendering establishment, dairy, steam engine, steam boiler, or any establishment by which, in the opinion of the Board of Public Improvements, anything would be discharged into the sewers, tending to obstruct or injure the same, or to cause a nuisance, shall be connected with any public or district sewer, except through one or more intervening catch basins as may be prescribed by said Board, and in case the matter discharged by any establishment cannot in the opinion of said Board be rendered harmless to the sewer, or the public

health, they shall be excluded from the sewer entirely.

Toronto (No. 4191) : No person shall damage or injure any common sewer or private drain, or sewer communicating therewith, and no person shall cause or permit the discharge of steam or hot water above a temperature of 150 degrees Fahrenheit from any engine or boiler, or oil, tar and grease into any common sewer or private drain, or sewer communicating therewith. (This should prevent the direct connection of house heating boilers, and low pressure heating plants also, to the drains).

Penalty For Discharging Prohibited Materials.

St. Louis (Sec. 1618) If the drainage discharged from any dairy, slaughter house, chemical works or manufacturing establishment shall produce or form a deposit obstructing a sewer, or if ashes, manure, or any other substance thrown into any sewer or sewer inlet, shall choke or obstruct the same, the Sewer Commissioner shall immediately remove the obstruction, keeping an account of the cost of such removal, and shall certify an account of the cost of such removal, and shall certify an account of such cost to the person or persons from whose establishment or premises the material causing or forming the obstruction came, and if such person or persons shall fail, neglect or refuse to pay said sum into the City Treasury within five days after demand has been made, he or they shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in a sum double the amount so due and owing and the payment of the fine and cost shall operate as a discharge in full of said demand.

Toronto : No reference in plumbing and drainage by-law referred to.

Reports of Water Service Connections.

St. Louis (Sec. 1725) : It shall be the duty of all persons, firms or corporations carrying on the plumbing business in the City of St. Louis, to make weekly returns to the Assessor and Collector of Water Rates of all alterations or additions to the plumbing work made by them during the previous week. The returns shall state the nature of the additions or alterations and such other particulars necessary to a full understanding of the subject, as the Assessor

and Collector of Water Rates may require.

Toronto (Sec. 20) : Every master plumber, who shall himself, or by his apprentices, agents or employes, make any extensions of, or alterations to, or shall remove any tap, pipe or other fixture attached to the pipes of the Water Works shall, on the last day of the month in which such extension, alteration or removal is made, report the nature and extent of same in writing to the City Engineer upon printed forms to be supplied by him.

Permits to Plumbers Only.

St. Louis (Sec. 1726) : No person, firm or corporation carrying on the plumbing business shall allow his or their name to be used by any person, directly or indirectly, either to obtain a permit or permits to do any work under his or their bond, or make any misrepresentations or omission in weekly returns, or leave the water turned on after completing and testing the plumbing.

Toronto : No provision to cover.

Enforcing Sewer Connections.

St. Louis (Sec. 426) : Every water closet or privy constructed and used in any dwelling house or building within the limits of the City of St. Louis, which water closets or privies are not connected with some public, district or private sewer adjoining the grounds on which said building is erected and properly connected with the public sewer system shall be deemed a nuisance.

This is undoubtedly a wise provision as it compels the general use of a sewer system after the same is once constructed.

Wooden Wash Trays.

St. Louis : Wooden wash trays or sinks will not be allowed.

Toronto : Not specially mentioned.

Soil Pipe for Future Use.

St. Louis : If soil or waste pipes are placed in buildings for future use, the necessary ventilation pipes must be put in, and the work be tested and inspected as if for immediate use. All openings not in use must be closed by plugs screwed or caulked in.

Toronto : No provision made.

Connections for Vents and Traps.

St. Louis : All ventilation or anti-siphon traps must be branched into

traps as close to crown as possible, and be provided with a soldering union or trap screw, which shall not be more than four inches from the connection with trap.

Toronto: These requirements not specially mentioned.

Back Vents for Traps.

St. Louis: Back vent pipes for traps may run separately to roof or be connected with a soil or waste pipe above the highest fixture, with an inverted Y branch placed not less than 3½ feet above floor.

Toronto: No trap vent pipe shall be less than three inches in diameter where it passes through the roof, and all vent pipes must continue to rise after leaving the trap and pass through the roof or connect with soil pipe.

Size of Trap Vent.

St. Louis: Ventilation pipes from sinks, bath tubs, wash basins, wash trays, and other fixtures, must be the same size as the waste pipe from fixtures.

Toronto: The vent to be not less than one size smaller than trap, and no vent of less than 1½ inches in diameter.

Water Seal of Trap.

St. Louis: All traps must have a water seal of at least 1½ inches.

Toronto: Not specified.

Material for Pipes.

St. Louis: All ventilation, soil or waste pipes must be of lead, extra extra heavy cast iron, or wrought iron. Wrought iron pipe must not be less than three inches in diameter, with screw joints.

Toronto by-law mentions the use of terra cotta and cast iron for soil and lead and iron for vent pipes, but not mention is made of the use of wrought iron pipe with screwed joints and heavy fittings for soil or waste pipes.

Local Vents.

St. Louis: Water closet traps shall not receive the discharge of or be connected with any other fixture than the one water closet.

Toronto: Waste from bath and basin will not be allowed to connect to water closet bend, and must have a separate fitting or connection to receive the same.

Soil Pipe Above Roof.

St. Louis: Above the roof galvanized sheet iron pipe may be used.

Toronto: Sheet metal shall not be used.

Separate Traps.

St. Louis: No special mention.

Toronto: All water closets, slop sinks and urinals must be supplied with 3-inch local ventilation, connected to a heated flue.

Ventilation and Construction of Closet Rooms.

St. Louis: Not specifically defined.

Toronto: No mention other than local vents.

Returns of Plumbing Work.

St. Louis: Plumbers are required to make full returns of plumbing work done by them within forty-eight hours after completion.

Toronto: No corresponding requirement.

MONTREAL'S PLUMBING REQUIREMENTS.

Although the Montreal by-laws are generally admitted to be most comprehensive and thorough, so far as they go, it cannot be claimed that they are absolutely perfect. Theory is one thing, but practice is another, and although sanitary science may prove conclusively that such a regulation is necessary it is quite a different thing to get that regulation on the statute book. In Montreal, for instance, those who are working for advanced sanitation find it difficult to get the provincial authorities at Quebec to give them powers to carry out suggested improvements. Of course it must be admitted that powers to make certain drastic alterations and enforcements must not be lightly granted. Many instances can be quoted where amendments have been passed, and certain rights granted in the so-called interests of the public only for the authorities to find afterwards that it would have been far better for the public if they had absolutely refused to move in the matter. But the question is different when the whole weight of expert advice is united in the interests of certain reforms, and when men, whose livelihood is bound up with these reforms, are earnest advocates of them. In instances like these there cannot be much danger of the authorities making a mistake in granting the powers asked for. Such is the case with the plumbing powers of the Health Department of the City of Montreal. Many amendments have been secured from Quebec, but many more have yet to be granted. From time to time the hands of the civic authorities are strengthened, but much fighting has to be done to secure them. That the reforms, which the sanitary experts in Montreal desire, will come some day, is generally admitted, but as we have said, governments are hard to move. There are always inter-

ests likely to be affected by the amendment or the granting of new powers, ready to oppose advancement with tooth and nail, and there is always the great difficulty of persuading men who are not sanitarians that certain reforms are absolutely necessary.

For instance, there are many houses in Montreal with no bath tubs. The law is very vague on the point, and makes no direct charge upon a landlord to put in a bath tub. In Washington it is compulsory to have a bath tub for each suite of family apartments, but in Montreal, as apparently in Toronto, there is no direct law on the point. The health department in condemning the sanitary arrangements of a house can be influenced by the fact that there is no bath, but it cannot directly enforce the putting in of this necessary article. This is one of the points on which Montreal sanitarians find it difficult to induce the Quebec authorities to give them full power.

Again, there is the question of direct ventilation and light for rooms with water closets. The Montreal by-laws on this point say that every room where there is a water closet must communicate with the external air by means of a shaft or duct of at least 3 inches diameter, when such shaft or duct shall not extend through more than two storeys, and of 4 inches for a greater number of storeys, but nothing is said as to light. Very few flats, if any, now being erected in Montreal, not provided with extension rooms and kitchen, have the water closet on the outside. In the top flat, light and ventilation can be provided by means of a skylight, but the other two flats have to be content with a ventilation pipe, which after all is but a primitive arrangement, and not very effective. Landlords are naturally not very keen on sacrificing room space and the configuration of their building to put the water closet on the outside, although in some cases an attempt is made to improve matters by putting a well in the structure. It is a matter for serious consideration that such water closets should be permitted, especially in crowded flats. It cannot be claimed that the Montreal by-laws are perfect unless this section of the law is amended, even if landlords have to sacrifice room space.

With regard to plumbing repairs the laws are well defined and admit of little chance of misinterpretation. No alteration of drains or plumbing work in any building affecting its sanitary conditions the cost of which exceeds \$25, must be undertaken before giving notice to the sanitary engineer.

It can be seen that although the Montreal by-laws are very good, they are open to improvement. That this will

desire is there; the right to carry ing, and little by little the provincial
amendments into effect is alone want- government is giving way to progress.

Analysis of Montreal's Requirements.

Separate and direct service.....	Yes.
License may be suspended.....	Yes.
House drain (inside).....	Cast Iron.
House lateral (tile or vitrified pipe).....	Conditionally.
Limit of tile pipe.....	5 Ft. Outside Wall
House service size defined according to area roof or lot.....	Yes.
Surface drain with strainer.....	Not Covered.
Hot liquids, vapors or gases to service.....	Not Permitted.
Range boiler sediment cocks direct.....	Not Covered.
Drains to be above ground.....	Optional.
Smallest size soil pipe.....	4 Inch.
Relieving wall arch in wall for pipe.....	Not Covered.
Venting of fixtures—exception.....	Conditionally.
Horizontal vents under floors.....	Not Covered.
Size of vents specified.....	Yes.
Trap and waste, same size.....	Yes.
Safe and pan drips.....	No Direct Connection.
Designating marks and maker's name cast on cast soil pipe.....	Not Covered.
Wrought iron waste, soil and drain permitted.....	Yes.
House sewer trap.....	Not Permitted.
Air inlet.....	No.
Direct ventilation and light for rooms with water closets required.	Not Covered
Apartment separate from sleeping rooms required for water closets.	Not Covered.
Pan, valve, plunger and offset closets allowed.....	No.
Size of flush-pipe defined.....	Not Covered.
Defective and non-approved fixtures may be condemned and removed.	Not covered.
Provision for outside closets.....	Conditionally.
Close connection specified.....	Not Covered.
Bath tub compulsory for each suite of family apartments.....	Not Covered.
Wooden copper-lined tubs permitted.....	Not Covered.
Defective tubs may be condemned.....	Not Covered.
Storage tanks required where water supply is not ample.....	
Rainwater leaders to be trapped.....	Conditionally.
Rainwater leader inside house cast iron.....	Partly.
Disposal of Rainwater can be enforced.....	Not Covered.
Overflows and drip direct to sewer.....	No.
Wooden wash traps permitted (except for certain purposes).....	Not Covered.
Trap vents or sewer ventilation to chimneys.....	No.
Tests of soil, waste and vent pipes.....	Smoke.
Final inspection.....	Smoke.
Repairs and extensions defined.....	Conditionally.
Defects and improper material defined.....	Not Covered.
Means for dispensing with terra cotta house sewers.....	Not Covered.
Local vents.....	Not Compulsory.
Yoke ventilation.....	Not Compulsory.
Back vent lines independent of main stack.....	Not Compulsory.

Iron Drains Better Than Tile

George Clapperton, of Bennett & Wright, Toronto, Shows That Cost of Iron is Little More Than Tile While Advantages Are Much Greater.

In recent issues of Plumber and Steamfitter you have discussed the plumbing systems in general, as well as the system of inspection as practised in Toronto, a subject of interest, not only to those "in the trade," but every thinking householder in Toronto, as it is the duty of every man who has plumbing work done for him to see that it is thoroughly inspected by the corporation officials.

I am sure if the general public would give thought to what improperly done and unsanitary plumbing means with regard to health, they would give this branch of work more consideration, and would assure themselves that all work done for them was performed according to city by-laws and under inspection.

I would like to see the good work that has been taken up by your paper continued, and see every man in the busi-

ness interested in raising the standard of the trade by pointing out through our paper the defects in our plumbing system as they find them. The subject could then be discussed and proper steps taken to have the objectionable features removed.

Defect in Drainage System.

In this connection I would like to point out what I consider a defect in our drainage system in allowing tile pipe to be used for soil drains inside the walls of any building.

Owing to the unreliable material from which tile pipe is manufactured tile pipes are very easily broken, so that no dependence can be placed on them so far as durability is concerned. Tile drains may be well laid, water-tested and passed by the inspector and be an apparently perfect drain, when a few weeks later the smoke test is applied it is very often found defective. In some cases there has been a settling of the earth or careless refilling of the trench which has cracked or broken some of the joints. A corroboration of this can readily be found by looking over the temperature reports filed at the city hall.

Again, we find the different inspections to which drains are subjected to very frequently split the pipe and destroy the cement joints.

Advantages of Tile Questioned.

Some advocates of tile drains claim they are more durable if properly laid on wooden planks or in a bed of cement. This may be true, but when we consider the comparative cost of iron drain and tile laid this way, I am sure we would recommend the former.

When the plumber advocates the use of iron in preference to tile, the first question that arises is with regard to cost. Considering the question on this basis, I claim that the excavating and refilling of trench for tile drains is more expensive than for iron. Considerably more care is required in grading the trench to secure proper "fall," and also in refilling.

Cost of Tile and Iron Pipe.

The cost of tile drains laid (not including excavation and refilling) is 20c per foot, and for cast iron 10c per foot, or to lay drain complete, supplying all material, is approximately as follows:

4-in tile drain, per yd.	\$1.50
4-in. iron drain, per yd.	2.00

When we consider the distinct qualities of the two materials, I am sure that every master plumber would strongly advise the use of cast iron pipe.

Iron drains possess many advantages over tile. They are not so easily broken, the joints are perfectly gas and water-

tight, and cannot be broken by carelessness in refilling the trench.

The iron drain is not so affected by the difference in atmospheric conditions; that is, by contraction and expansion. It can safely be laid to all sources of water supply, such as wells, cisterns, etc., without any danger of water contamination and finally costs but a small amount more than the tile. The extra cost of an iron drain for an ordinary house averages about \$15.

Diseases Traced to Tile Drain.

I might recite an instance that occurred, where milk purchased from a

dairy was found, under inspection, to be strongly contaminated. The trouble was located finally in an imperfect connection made in a tile drain, through which foul air and sewer gas was constantly passing into the room where the milk was bottled. This could not have happened had the drain been an iron one.

I would like to have touched upon the main trap and breather, its advantages and disadvantages, as I find them, and will be pleased to do so in a future issue. I would, however, like to see the tile drain problem discussed in *The Plumber and Steamfitter*, and I think the Master Plumbers' Association should take the subject up and find a remedy.

Department of Public Health Suggested

Dr. Montizambert, Director-General of Public Health and President of the Canadian Medical Association Suggests that National Government Establish a Department of Health—Practical Address on Sanitation.

At the annual gathering of the Canadian Medical Association at Ottawa on June 9, Dr. Montizambert, president of the Association, outlined the hygienic rules of primitive communities and traced the development of the science of sanitation from the earliest times up to the present date. He dealt particularly with the duties of the municipality and of the state in regard to the public health, and closed by urging the establishment of a department of public health in Canada. Sir Wilfrid Laurier, who was present, gave it to be understood that he agreed with the speaker in all that he had said.

Four Eras in Sanitary History.

He divided the history of sanitation into four eras: First, the domestic era, in which the centre of hygienic regulation with the individual household; secondly, the Roman or municipal period; thirdly, the Gothic or National period; and, fourthly, the international era, which had its origin within the present generation.

The most perfect set of rules produced under the first era were those attributed to Moses, and set forth in the Book of Leviticus. Than these no set of regulations better adapted to the people for whom they were prepared had ever been drafted. He spoke of the custom of primitive people in regarding dirt as something sacred, a frame of mind which, he said, had lasted down until mediaeval times, when the hermits and ascetics had been in the habit of looking on pollution of the body as signifying purity of heart.

The individual family was still the great centre for the spread of hygiene.

Public legislation was all very well, but in his opinion more could be accomplished by instruction in the home than by laws. "If," said he, "every citizen could be led to consider himself personally responsible for the public health, if every householder would see that his back yard was kept in a sanitary state and that his plumbing was in good condition, the work of the health officers would be immensely reduced."

The proper ventilation of the home was also, he stated, of the greatest importance while too much weight could not be attached to the removal, not the mere disturbance of dust. Ice, he held, should not be placed directly in refrigerators and water coolers, but put in a jacket surrounding the objects to be cooled.

The doctor closed his discussion of sanitation in the home with an appeal to let the sun and fresh air into houses. "It is," said he, "far better to have carpets faded by the sun than to have cheeks faded by sickness."

Municipal Sanitation.

The second era, that of municipal sanitation, had been named after the Romans because they were the first who made the sanitation of their cities a public care. He spoke of the great sewerage system of Rome, of the Cloaca Maxima, attributed to Numa, which after three thousand years of constant use is still in service, and he mentioned the great aqueducts which had supplied pure water to Rome, Jerusalem and the ancient city of Mexico. He urged that it should be the especial care of the municipal au-

thorities in every modern city to establish authorized inspection of every department in which the public health was concerned. In particular he insisted on the importance of the inspection of the dairies, abattoirs, schools and plumbing; the proper removal of garbage, and the limitation of the nuisance caused by smoke from soft coal.

Inspection of Plumbing.

In regard to the inspection of plumbing the doctor spoke at some length. He stated that on the health of the household the plumber is an even more important factor than the doctor. The presence of sewer gas in living and sleeping apartments, due to improper plumbing, was fatal. It might not indeed be the direct cause of death, but it so weakened the system that disease germs found an easy entry. He urged that not only should all plumbing be inspected, but that the municipal authorities should work in conjunction with the heads of the trade to see that none but properly qualified men were allowed to enter the business. He stated that he would have all plumbers pass an examination, and in the absence of any such test he urged his hearers whenever possible to see that their plumbers were provided with certificates from the British Board of Sanitation, such certificates being now obtainable in Canada.

He also regarded the registration of all houses in which infectious diseases had occurred as now followed out in a large number of cities an excellent measure inasmuch as owners of houses were forced to see that their property was in a sanitary condition if they wished to secure tenants.

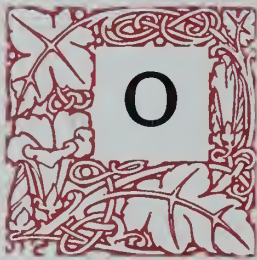
National Sanitation.

The era of national sanitation was called the Gothic, explained, because Theodoric the Ostrogoth had been the first to promulgate hygienic regulations for a whole nation. In this regard he spoke much of tuberculosis, which carried off in Canada eight thousand people annually. According to the best economists this represented a loss to the country of at least \$8,000,000.

Dr. Montizambert mentioned as the duties of the national government the attention to the proper sanitation and disinfection of railway cars and passenger vessels and the inspection of all food and liquors. He closed by urging the establishment of a national board of health, composed of the Dominion health officer and others appointed by the various provinces. Such a board he held ought to meet at certain stated periods and make such recommendations as they thought advisable to the government.

Letter to Canadian Pl

The Standard Ideal



YOUR attention has been directed to a Circular issued by Messrs. Thos. C. Collins & Son, of Montreal, Sales Agents for the Standard Sanitary Manufacturing Company, of Pittsburgh, U.S., headed :—

“IMPORTANT NOTICE TO CANADIAN ARCHITECTS AND TRADE.”

Up to the present time, we have ignored the attacks, direct and indirect, cast at us by the above-mentioned firm, believing them to be but the mis-directed efforts of Trade jealousy, but after perusing their recent Circular letter, we feel it obligatory upon ourselves, and as a protection to the Architects and Plumbing Trade in general, to make public a few of the actual facts.

THE STANDARD **Ideal** SANITARY COMPANY, a Company with Canadian Capital invested, was incorporated under a Provincial Charter in November, 1902, and their business was acquired by the Standard **Ideal** Company, who received a Charter from the Ontario Government on October 4th, 1905.

The Standard **Ideal** Company, L

mbers and Architects Company, Limited

Since the inception of the above Companies, the business has been conducted under the Charter Name, operating as a Canadian Corporation manufacturing goods in Canada, for the Canadian Trade, and this fact is known to every Architect, Plumber and Jobber throughout the Dominion of Canada.

The assets of our Company amount to over a half a million of dollars.

Our Trade Mark is original and registered with the Government in 1903.

FOUR YEARS after our Company had been in existence The word "Standard" was registered by the Pittsburgh Company, i.e. in July, 1906

Our Company has during that period acquired about 90 % of the Trade in Porcelain Enameled Cast Iron Ware of this country, this being due entirely to superiority of Ware over that of any of our Alien Competitors.

We are advised that in using our own name, we are not infringing upon any person's or Company's rights. We have always conducted our business under our legal name, and from our registered place of business, Port Hope, as a Canadian Corporation, making and marketing our Wares in the Dominion and having no connection whatever with any foreign Corporation.

ited, - - - - Port Hope, Ont.

Ventilating Schools and Public Buildings

How the State of Michigan Supervises the Heating and Ventilation of Charitable, Penal, Educational or Reformatory Institutions.

The following recommendations of the State Department of Health of Michigan concerning the detail of plans for charitable, penal, educational and reformatory institutions looking to the most approved sanitary conditions will be of interest to architects, heating engineers and the general public throughout Canada.

Hundreds of school houses and other institutions requiring good and sufficient ventilation and heating are annually being constructed throughout Canada. In too many cases no proper provision is made for providing the occupants of such buildings with the required amount of pure air at all times.

The question of simple heating without due consideration of the much more important one of ventilation receives a certain amount of attention. Ignoring the question of ventilation, which should be a matter of first consideration, some money in the first place is saved at the expense of untold losses in impaired health, with consequent disease and very probably premature death in many cases.

School Disasters Teach Lessons.

The Collinwood and Hochelaga disasters have firmly impressed the public as to the necessity of improved methods of construction of school-houses from the standpoint of safety from fires.

Improved methods in connection with the sanitary arrangements are just as essential and should receive just as considerate attention.

Ventilation work when properly done costs money but it is not money wasted or squandered. It is no experiment and good and reliable methods are to be had. When the work of designing the plants required for heating and ventilating is placed in the hands of competent heating and ventilating engineers good results are sure to follow.

Ventilation long before this would have received more attention were it possible to perceive by the sense of sight or smell immediately the ill effect of badly ventilated school-rooms due to a lack of the proper change of air, and too many have thought of the matter only in the light of its first cost or have not appreciated the necessity for the maintenance of anything but a reasonably comfortable temperature, but that state of affairs is fast passing.

Legislature Should Pass Law.

It might be interesting to know if every school-house or other public institution where a considerable number of persons congregate for any length of time, that is now being altered or constructed in Canada to-day is receiving at the hands of those in charge, the attention to the matter of ventilation that they should.

If they are not is it not about time there should be sufficient regulations placed on the various provincial statutes that would bring about a correct state of affairs.

The right and the necessity of the government to act in such matters is fully recognized under its public powers and there should be no tardiness in placing on our statute the proper regulations.

Examination of Plans.

Section 2229 of the Compiled Laws of Michigan of 1897 provides "That before the board of any charitable, penal, educational or reformatory institution shall determine on the plan of any building, or on any system of sewerage, ventilation or heating, which has been authorized by the legislature to be constructed, such plan shall be submitted to the Board of Corrections and Charities and the State Board of Health for examination and opinion thereon; and the board so submitting such plan shall, in its biennial report, show to what extent it was approved by the boards so examining them."

For the purpose of aiding the boards of State institutions in the adoption of plans for buildings which shall be in accordance with the best modern methods of sanitary construction, the following statement has been prepared relative to certain details in plans examined by this Board in the past which were not approved, together with the opinions and recommendations of the Board thereon:

Direct Method of Heating.

Not approved for the reason that it does not provide for the supply of fresh air to the rooms. Recommended that the indirect method of heating be used instead. The direct-indirect method is not approved, for the reason that it cannot be depended upon to furnish a sufficient amount of fresh air, of the proper temperature, at any time, and for the

further reason that it is very unreliable during the prevalence of high winds.

The "Fan" Method.

In past years, objections have been made by this Board to the "fan" method of heating on the following grounds: First, That it is complicated, and therefore requires skilled help for its proper operation and maintenance. Second, That there is no certainty that the fan will always be in motion during the time when ventilation may be necessary, and that when the fan is not in motion the flow of air through the fan, heating coils and flues of somewhat limited area, would be insufficient to maintain the air of the rooms in a sufficiently pure condition. Third, That the construction and maintenance of the fan and accessories involve expenses which are not necessary if the ventilation is properly planned and constructed. There are, however, certain rooms in some State buildings, as assembly rooms and laboratories, in which the air could not be changed sufficiently often by natural draft, and for such buildings a forced draft is considered necessary.

Regulation of Air in Rooms.

Many plans submitted to this Department include no provision for the regulation of the temperature of the air in rooms other than by shutting off the steam from the indirect radiators or by the closing of the register slats. Not approved for the reason that the air supplies would be thus curtailed or cut off entirely. Recommended that bypasses be provided, so that either cold or tempered air may be discharged into the rooms when the temperature of the air in the rooms may be too high. In any building containing a large number of rooms, or where the regulation of the temperature by hand would not be likely to receive proper attention, a system of automatic temperature regulation would be desirable.

The taking of fresh air supplies from basement corridors, or from basement rooms not specially prepared and set apart for the purpose, not approved, for the reason that the air of such places would be liable to serious contamination, and might easily become infected by the dust tracked in from outdoors. Recommended that the fresh air supplies be taken from outside the buildings, at points far removed from possible sources

of contamination, and conveyed to the indirect radiators in air-tight metallic tubes, preferably of galvanized sheet iron, with which material, also, the radiators should be encased. Wherever practicable, the indirect radiators should be placed in special fresh air rooms, which have cemented floors, plastered ceilings, well screened windows and tight fitting doors. Such rooms should be kept under lock and key and frequently cleansed. Common sense would dictate that such rooms should never be used for storage purposes, nevertheless that is often done, even in State institutions.

Use of Wooden Flues.

The use of wooden flues for the conveyance of fresh air from outdoors to the warming chambers and for the removal of vitiated air from the rooms, not approved, for the reason that the wood would shrink and cause openings which would tend to break the draft in the flues, and, in the case of the fresh-air flues, permit the entrance to the flues of air from undesirable sources. Recommended that all flues be of brick or galvanized sheet iron.

Improper Location of Registers.

The placing of fresh-air registers in the floors of rooms, not approved, for the reason that the flues under them would be receptacles for dust and dirt, possibly infected, from the sweeping of floors and from the shoes of persons walking over them; they may also become receptacles for the sputa of persons suffering from pulmonary diseases, and later distribute the infective particles of the dried sputa throughout the rooms and thus jeopardize the lives of others. Recommended that they be in the walls at a height of not less than six feet from the floor lines.

Vitiated-air Registers.

The placing of vitiated-air registers in the floors, not approved, for the reason that the air in passing from the rooms to the vertical flues would have to make two square turns, thereby reducing its velocity very considerably.

The placing of vitiated-air registers at any point above the floor line, not approved, for the reason that the fresh warm air would escape from the rooms before it had passed over the floors, and leave strata of comparatively cold and stagnant air below the registers. They are sometimes placed both at the ceiling and floor levels in the same rooms, for summer and winter use, but, unless the greatest care is exercised, both are liable to be open at the same time, and the bulk of the air would pass out at the ceiling registers, with the result mentioned in the first part of this paragraph. Summer ventilation can be best accomplished by open windows, and for winter use,

the vitiated-air registers should, in every instance, be in the walls at the floor levels.

Vertical Ventilating Flues.

The placing of the vertical ventilating flues in outside walls not approved, for the reason that the air in them would be cooled down to the point of retarding or reversing the draft. Recommended that these flues be on or in inside walls, and as nearly opposite to the windows, or to the most exposed walls of the rooms, as possible. By this arrangement the inflowing air would follow the natural movement of air in the rooms, viz., first upward to the ceilings, thence across the rooms to the exposed walls, thence downward to the floors, and, finally, back to the sides at which it entered the rooms.

Limited Areas of Ventilating Flues.

In many plans submitted for examination, the ventilating flues are too small for the proper ventilation of the rooms by natural draft alone. The mistake is also frequently made of providing flues of the same areas for rooms of the same size and general character, but on different floors. Recommended that all ventilating flues be of the proper areas to effect changes of air equal to at least 33 1-3 cubic feet per minute for each person in ordinary day and sleeping rooms, and at least 50 cubic feet per minute for each occupant in hospital buildings, when the difference between the temperatures of the outdoor air and of that in the flues is not greater than twenty-five degrees. With a greater difference between these temperatures the draft in the flues would be much greater, and might require to be regulated during the very cold weather. Where steam heat is used, it would be well to insert in each vitiated-air flue a small amount of steam pipe for the purpose of accelerating the draft in the flue when the climatic conditions might be unfavorable for proper ventilation. The following table will be of service in determining the proper areas of ventilating flues, where the movement of the air is to be by natural draft alone:

The velocity of air in flues, in feet per minute, due to natural draft, with a difference of twenty-five degrees between the temperatures of the outdoor air and that in the flues.

Height of flue, in feet ..	10	15	20	25	30	35	40	45	50	60	70	80	90	100	125	150
Velocity of air	171	210	243	270	297	321	342	363	384	420	456	486	516	534	603	666

In the table, a deduction of fifty per cent. from the theoretical velocity has been made to allow for all ordinary resistance in the flues, such as friction, change in direction, etc.

To make use of the table, determine on the number of persons who will usual-

ly occupy the room, together with the height of the vitiated-air flue, and divide the total amount of air which must be removed from the room every minute by the velocity shown for the given height of the flue. For example: In an ordinary room occupied by twenty persons, the necessary change of air would be equal to $20 \times 33 \frac{1}{3} = 666 \frac{2}{3}$ cubic feet per minute, and assuming that the height of the flue is 30 feet, we then have $666 \frac{2}{3} \div 297 = 2.24$ square feet as the necessary area of the flue.

To allow for the space taken up by the grills, the areas of the face plates of registers, together with the openings leading from the registers to the vertical flues, should be one-third larger than the areas of the vertical flues.

Improper Methods of Disposing of the Vitiated Air.

1. Causing the vitiated air to pass downward to the basement before it enters the main vertical ventilating flue, not approved, for the reason that a fire must be kept burning at the base of the main vertical flue, or a fan must be employed, in either case at considerable expense, to pull the air downward from the rooms, and for the further reason that when the fire might be allowed to go out, or the fan should be stopped, there would be little, if any, movement of air in the direction intended. Further, the practice of exhausting the vitiated air from a building by means of a fan is not good for the reason that air would thus be drawn into the rooms from the basement and other undesirable sources, and through cracks and crevices in the doors and windows, causing unpleasant drafts.

2. Connecting the vitiated-air flues of two or more rooms with each other, or with a common ventilator in the attic, not approved, for the reason that the flues would usually be connected with each other, or with the main ventilator, at an angle, and the cross currents of air thus established would tend to reduce the draft in some one or more of the flues. This condition would be intensified where the flues were from rooms on different floors, and also during certain conditions of the weather.

3. Discharging the vitiated-air from all the rooms into the attic, from whence it would be compelled to escape through

openings in the roof, or gables, not approved, for the reason that a serious interference with the draft in some, if not all, of the flues would be likely to take place during the prevalence of high winds.

4. Openings direct from each room or

from a number of rooms, into a common vertical flue, not approved, for the reason that cross currents of air would thus be established, and for the further reason that during the prevalence of high winds the rooms on the leeward side of the flue would have little or no ventilation.

5. Connecting the vitiated-air flues from many rooms with a main ventilating chamber in and running parallel to the ridge, without a cross partition in the ridge ventilator between each flue, not approved, for the same reasons given in the preceding paragraph, numbered three.

Recommended that the vitiated-air flue of every room in a building be extended to a point above the roof separate and distinct from any other flue, but, for convenience and architectural appearance, several flues might be grouped and pass through the roof as one stack.

Re-warming Air of Rooms.

The practice of conducting the cold air from a hallway, or other part of a building, to the heating apparatus to be re-warmed, not approved, for the reason that the air supply would be constantly deteriorating in quality, and for the further reason that a large amount of dust, possibly infected, which would otherwise settle and remain quiescent, would be thus constantly agitated and well distributed throughout the entire building.

Lack of Provision for Ventilation.

In many plans, no provision whatever is made for the ventilation of certain rooms in State buildings, as attendants' rooms, dining rooms, offices, waiting rooms, etc., and it is recommended that provision be made for the ventilation of every occupied room in such buildings.

In some plans, provision is made for the ventilation of groups of small rooms by discharging fresh warm air into the adjacent corridors, from whence it is expected to find its way into the rooms through the transoms. Where a vent flue is provided for each such room, and when the transoms might be open, there would probably be a movement of air, more or less sufficient, into the rooms; but where there is no such provision for the removal of vitiated-air from the rooms, the fresh air would not enter the rooms in sufficient quantity, particularly in the case of rooms located on the most exposed sides of the buildings. Further, with this method of ventilation, the natural upward movement of air in the staircases, with which such corridors communicate, would tend to deliver the greater portion of the

fresh air into rooms on the topmost floors.

In other plans, provision is made for the ventilation of groups of small rooms by means of direct-indirect radiators in the rooms and by ceiling vents in the adjacent corridors, the effect of which is to cause the inflowing fresh air to pass out of the rooms, through the transoms, before it has had time to make any considerable change in the air of the rooms.

REVOLVING CHIMNEY TOP.

Many otherwise good chimneys are spoiled by interfering currents of wind due to higher adjoining buildings, overhanging trees, etc. The Gurney Foundry



Revolving Chimney Top.

dry Co., Toronto, are now placing on the market their Oxford cast iron revolving chimney top, which is claimed to cure all such chimney troubles. The top is made entirely of cast iron, and the cap revolves with every change of wind, effectively preventing all down drafts. It is adjustable to all sizes and requires no additional labor or material to make it complete. It is sold at a moderate price and is cheaper than making extensions of sheet iron.

FIGHT OVER NAME.

Canadian architects and plumbers have been advised during the past month that the Standard Sanitary Manufacturing Company, Pittsburg, claim as their exclusive property the word "Standard" when applied to porcelain enameled plumbing fixtures. They announce that they have entered suit

to prevent the Standard Ideal Company, Port Hope, Ont., from using the word "Standard," and further state that they have taken out a Canadian charter for a \$250,000 company and will locate a plant in Canada to manufacture for the Canadian trade.

The Standard Ideal Company, Port Hope, in a circular letter published elsewhere in this issue, reply that they have a perfect right to continue to use the word objected to, having organized the Standard Ideal Sanitary Company in 1902, registered their trade mark in 1903, and taken out a charter in 1905 as the Standard Ideal Co., Limited.

WINNIPEG PLUMBERS FINED.

The long-drawn-out litigation arising out of the claim for damages entered by the Master Plumbers of Winnipeg, against the Plumbers' Union as the result of the strike two years ago, was concluded on June 5., when Justice Mathers gave judgment which will have a very far-reaching effect on all similar labor troubles. He found the defendants guilty, and fined the union \$2,000, giving judgment against certain individual members for the amount. He also issued a perpetual injunction against picketing and interference with men at work. His Lordship said the men were within their rights in striking themselves, but they had done wrong in picketing the works of their former employers, and in inducing the men under contract to desert employment.

SCHOOL SANITATION

The sanitary condition of North York, Ont., schools was strongly denounced at a recent meeting of the York County Council by Inspector Mulloy. The inspector declared that "for both moral and sanitary reasons" more attention should be given by the trustees to the erection of proper retiring rooms for the boys and girls.

Randolph and Edmond Wright, two Toronto master plumbers, were fined \$16.50 each for fishing in American waters at the mouth of the Niagara River last week. The court was held in a grocery store and the Canadians were forced to pay their own railway fare while under arrest. They are now wondering if they weren't the victims of a hold-up game. The joke was on them but it may be on the other fellows before the case is dropped.

S. S. Clarke, formerly of Bennett & Wright, Toronto, and who for the past year has been a traveling salesman in Western Canada, has been "discovered" by Toronto lawyers and will be examined at Calgary in connection with the Toronto City Hall investigation, adjourned a year or so ago.

Sewerage System for Rural Homes

Construction of a Septic Tank System Described by M. J. Quinn—Revised From an Address Delivered Before the Medical Health Officers of Ontario.

It is perhaps no exaggeration to say that, having regard to the frequency with which it comes up for consideration, and many other circumstances, the question of properly disposing of sewage is one of the most important matters with which the health authorities throughout the country have to deal, and yet it is a remarkable fact that in these days of popular education, when the people enjoy the benefit of free literature and lectures on fruit growing, dairying, domestic science, etc., that a knowledge of so important a subject, and

that these bacteria, not only through their action remove and destroy the dangerous properties of such waste matter, but actually convert them into plant food, which, being taken up by the vegetation is again consumed for the

constituents and the conversion of the whole into liquids and gases, in which form it leaves the septic tank, the former to be distributed under the surface of the earth, where, by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates which are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described.

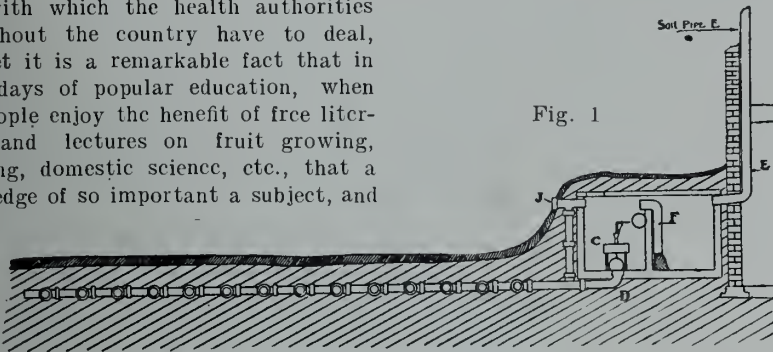
Method of Construction.

In Fig. 1 is shown an elevation of a complete system built on level ground, with the tank placed close to the wall of the building—where in fact the large majority of those now in use are located. The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture.

It will be noticed that the tank is divided into two compartments, an overflow pipe "F" being built into the dividing wall, the mouth of the said overflow being within about ten inches of the bottom of the tank, and being covered with a wire screen about the size of an ordinary pail, the mesh of said screen not exceeding three-quarters of an inch.

The main soil pipe is represented by "E" and should be directly connected

Fig. 1



one so closely allied to their physical and moral welfare is confined to a limited number.

True, a vast amount of experimenting has been done during recent years, and the matter has received a great deal of attention from scientific men, the results of whose labors have been freely discussed at medical conventions and reported in medical journals, but the valuable information so obtained has not reached the great mass of the people at all.

In the matter of public sanitation, the question of disposing of sewage in small towns and villages as well as in less populated districts, where by reason of its great cost a general system of sewerage is impossible, is daily becoming of greater importance, and that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the septic tank system, and believe that nearly all who have studied it are agreed that it is at once the most natural, most scientific, simple and economical system in use to-day, and speaking from a personal knowledge of scores of the systems, I am in a position to say that it is worthy of all the good things that are said of it.

Fundamental Principles.

It is a matter of common knowledge that living earth—or top soil—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and

sustenance of life. Pasteur divided these microbes into two classes, viz., Anaerobes, or those which lived apart from air, or derived their oxygen from decaying compounds, and aerobes, or those which require plenty of fresh air for their development, and as both classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deep in the earth, as for instance in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist; it may pass down deeper in a putrid state, and, finding its way to

the water supply, not unfrequently results in an outbreak of typhoid fever or some intestinal disease.

The two classes of microbes referred to, have properties somewhat differing from each other, but the net result of their work under proper conditions is the breaking down of the solid matter in the sewage, the disintegrating of its

with the closet, bath sink, etc. It extends from the same compartment in which the overflow is placed to a point two or three feet above the roof, said pipe acting not only as a conductor of sewage to the tank, but also as a channel by which any gases in excess of those in solution, may pass out to the atmosphere at a height which renders it

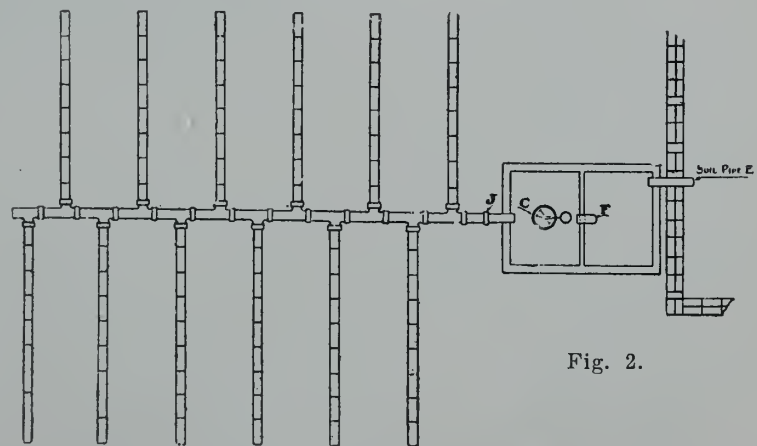


Fig. 2.

impossible for them to inconvenience the occupants of the building.

"J" in the second compartment admits fresh air, which passes freely over the centre partition—spaces being left in the top of the latter for the purpose—and up through the soil pipe to the roof.

In the centre of the second compartment is placed an automatic valve "C," caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

From this iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

How to Lay Tile.

Fig. 2 shows a plan of the whole system and illustrates one way in which the tile may be laid, though, as will be manifest, they would do equally well if all laid in one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are

Fig. 3.

not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil.

The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

The operation of the system is as follows: The sewage from the building enters through soil pipe "E", filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through overflow "F", which is turned down because of the presence of the bulk of the organic mat-

ter in suspension on or near the surface.

When the liquid has risen in the second compartment to the height at which the unloading float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before a discharge again takes place.

To prevent the gases of decomposition escaping through other than the proper channel the tank must be covered first with rough plank, and then with five or six inches of earth, which in turn, if desired, may be sodded over.

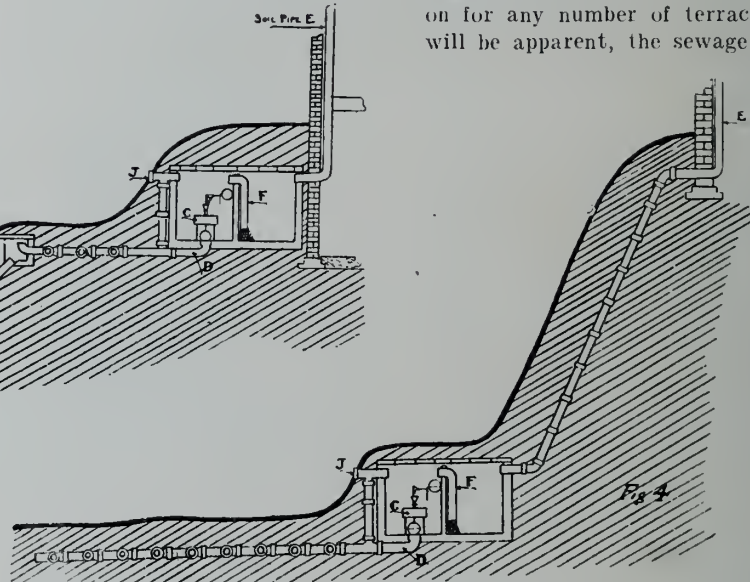


Fig. 4.

Size of Tank.

In figuring out the size of tank necessary, the following may be taken as a safe rule: For every occupant of a private house or hotel, allow three cubic feet of space in each compartment, the valve compartment not to be more than three feet nor less than two and one-half feet deep, while for a school or factory, where, as in the case of a house, nothing but domestic sewage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment (or one-half the tank) lay thirteen feet of four-inch field tile.

It will be obvious that, as in the case of ordinary stable manure, human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time,

and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, with the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Disposal of Effluent.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, refer to Fig. 3, which shows a number of terraces each receiving a portion of the effluent from the tank. It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the obvious result of which is that all the field tiles at that level must fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent, the sewage passing in-

to the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile, will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shows the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank, as shown, will not have any injurious effect on the latter. It will not freeze in winter, even when the frost penetrates the ground for sev-

eral feet everywhere except where the tiles are laid, and, as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden.

Variation in Size.

It sometimes happens that, for lack of space or some other reason, it is undesirable to have the first compartment as shallow as the second compartment must necessarily be (between two and a half and three feet) and in that event the tank may be constructed as shown

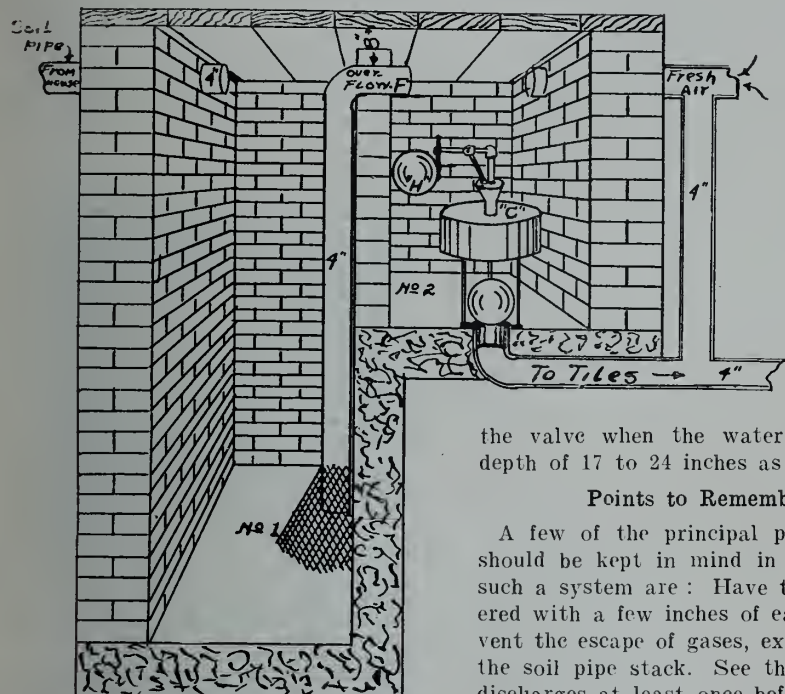


Fig. 5.

in Fig. 5, the depth of the first compartment not exceeding five or five and a half feet. In such a construction the overflow would be extended to within 18 inches of the bottom.

If desired, the screen on the overflow may be made as shown in Fig. 6, in-

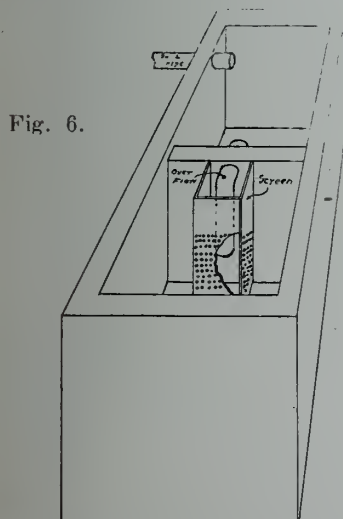


Fig. 6.

stead of wire, and in such construction one-inch boards would be used twelve inches wide and long enough to extend

from the top of the tank to the bottom. These, with the tank partition, would form a space 11x12 inches, in which the overflow would hang.

The three wooden sides of the box or screen would be closely perforated with three-quarter-inch holes extending from a point near the floor, up to a distance of say 18 inches, and such an arrangement will be found very satisfactory.

In setting the valve, the upper, or unlocking float, is placed on the under side of the lever, to which it is connected and set at the proper height to release

the valve when the water rises to a depth of 17 to 24 inches as desired.

Points to Remember.

A few of the principal points which should be kept in mind in constructing such a system are: Have the tank covered with a few inches of earth, to prevent the escape of gases, except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air is left in the top of the centre partition, and, finally, take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success is to be preserved.

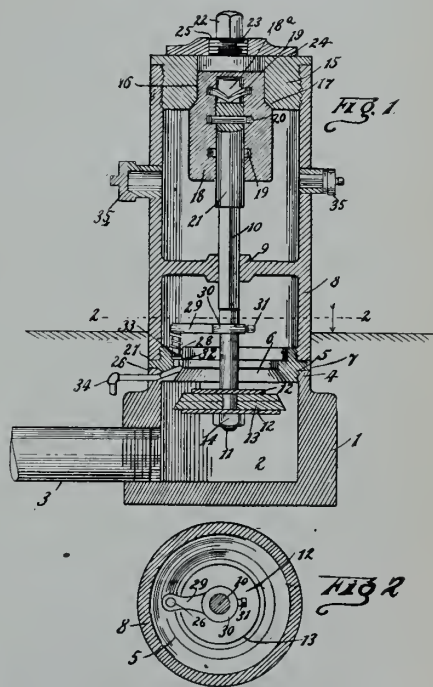
IMPROVED WATER HYDRANT.

The strong muscular effort which firemen have to exercise in opening the water hydrants in general use in Canada, the six to seven turns of the lever necessary before the valve is fully extended, and the often serious blocking of the hydrant through freezing, make apparent the fact that great improvement is necessary in the whole apparatus in the interests of those whose lives and property are in danger from the dread outbreak of fire. Every minute is precious when fire breaks out, and yet how often are the firemen delayed by defects such as we have described.

An improved water hydrant has been invented and put on the market by P.

B. Bentley, 70 Riverside St., Montreal, which entirely does away with these hindrances to the prompt and effective use of the hose. By means of a fine thread attached to the tumbler, the action of opening the hydrant becomes most simple. With one turn of the key—not six or seven as is now the case—one man can open the valve fully, and the great pressure of 350 pounds to the square inch of water can be delivered on the building. With most of the hydrants now in use not only are two men required to use the key, but the pressure is only from about 60 to 80 pounds to the square inch. The tumbler and rod are of steel giving a strength to the hydrant that is lacking in other kinds.

In addition to this rapid opening action, Mr. Bentley, by an ingenious plan entirely obviates the danger of the hydrant becoming frozen in winter by water remaining above the valve. In this hydrant the water is drained from below the valve, and not from above as in other hydrants, and when closed is perfectly dry and remains so. Thus there is no possibility of firemen wasting precious time in endeavoring to open a frozen valve by pure physical force, probably putting the hydrant out of action, and having to remove the hose to another place. The drip valve is of steel with a rubber face, and a spring attachment closes the valve perfectly. When fully open the valve can be moved



Improved Water Hydrant.

no further, thus doing away with the possibility of it being forced out of place in its socket. The whole hydrant offers advantages that fire departments throughout the country should not neglect to investigate.

NEWS OF THE TRADE IN CANADA

Nap. Duchesne, plumber, Three Rivers, Que., has assigned.

Pearson & Lock, "lighting men," Winnipeg, have dissolved.

H. H. Desautels & Co., plumbers, Montreal, have been registered.

Raoul Laboeuf & Co., plumbers, Montreal, have been registered.

R. H. Lefebvre & Co., plumbers, Montreal, have been registered.

Blouin, Desforges & Latourelle, plumbers, Montreal, have dissolved.

Curators have been appointed for A. T. Steele & Co., plumbers, Montreal.

Halifax plumbers report business unusually brisk for this season of the year.

Reihl & Barkwell, Winnipeg, are opening a plumbing and gasfitting shop in Yorkton, Sask.

R. J. Cluff, Cluff Bros., Toronto, has returned from a business trip to Winnipeg and the west.

The Orillia Hardware Co. will install a steam heating plant in the separate school in that town.

J. McAleer, a well known Chicago heating man, was in Toronto last week making some business calls.

W. C. Martin, in charge of Bennett & Sons' plumbing department, Gananoque, Ont., fell and broke his leg recently.

The John Lewis Company, Belleville, Ont., have installed plumbing and heating systems in the residence of Rev. A. Martin.

Bayer & Co., plumbers, Sydney, N.S., are closing their establishment at noon on Saturdays during the summer months.

John Lemmon, Kingston, Ont., has been at Sharbot Lake superintending the installation of a hot water job in the new Farmers Bank.

The Canadian Brass Mfg. Co.'s plant at Galt, Ont., which lately went into liquidation, is advertised for sale by tender up to June 20.

Wm. McGie, Belleville, Ont., has just completed the installation of a hot water heating system in the residence of F. Chas. Clarke.

J. Love, organizer for the Plumbers' International Union, was in Victoria, B.C., recently organizing the plumbers, steamfitters and gasfitters.

Ottawa Building Trades Council promises aid to the Winnipeg Plumbers' Union to appeal against the recent heavy fine for picketing during a strike.

St. John, N.B., plumbers have tendered for the contract of installing 20 baths in the Halifax Hotel and 24 baths in the Queens Hotel, at Halifax.

A meeting of the shareholders of the Mann Brass Mfg. Co., London, will be held on June 20 to consider the question of going into voluntary liquidation.

The assets of the Canadian Boiler and

Radiator Company, Hastings, which went into liquidation last summer, have been purchased by J. J. English, of that village.

The Northern Engineering Co. have the contract for supplying Fort William with 17 tons of pig lead at \$3.58 per hundred, a much lower price than has been paid in the past.

G. Janzen is doing a plumbing job in Paisley for Bernhardt & Gies, Preston, who have been awarded the contract for the hot water heating of the residence of Thos. Parker, Guelph, Ont.

The Hamilton Brass Manufacturing Company reports business to be decidedly brisk. The firm is at present refurnishing the bar of the new Prince of Wales Hotel at Brantford.

Geo. P. Hillen, of the Standard Sanitary Manufacturing Company, Louisville, Kentucky branch, was one of the visitors at the Brass Manufacturers' Association gathering at Toronto last week.

The following plumbers' license have been issued by the city clerk of Brantford, Ont., for the year 1908: Howie & Feely, Chas. Taylor, T. A. Cowan, Henry E. White, and J. D. Palmer & Co.

The W. W. Chown Company, Belleville Ont., has just installed a system of plumbing in the residence of ex-Mayor Walmesley, and also a hot water heating system in the residence of E. F. Dickens.

The King Radiator Co., Toronto, have been granted permission by the Ontario Government to increase their capital stock from \$100,000 to \$250,000 by the issue of 1,500 shares of new stock, valued at \$100 each.

James H. Doody, plumber, St. John, N.B., has just finished installing 20 new baths in the Dufferin Hotel there. Mr. Doody is also remodelling the plumbing in the new branch office of the Bank of British North America.

Cuyler K. Sanborn, president Bay State Brass Company, Haydenville, Mass., and also president of the Plumbers' Trade Journal Company, New York City, attended the Brass Manufacturers' Association convention at Toronto, June 9 and 10.

That business is branching out in Vancouver is shown by the purchase by the Vancouver Pipe Company of an acre and three-quarters just outside the city boundary with a view to erecting an iron foundry, construction on which will be commenced at once.

ESTABLISHING CANADIAN BRANCH.

M. D. Tillman, vice-president of the Honeywell Heating Specialty Co., is a young American of great experience and

training. Being a practical steamfitter, he has a strong grasp on the technical part of his business, and many of the heating specialties of his firm have been the outcome of much patient experimenting on his part.

Mr. Tillman was born in North Manchester, Indiana, and was educated in Indianapolis. After leaving school, being of a mechanical turn of mind, he went into the heating business, and throwing himself with energy into all branches of the subject, he acquired a practical and theoretical knowledge that has borne good fruit since. Not content with this, Mr. Tillman went through a private course of instruction in heating and ventilating, and seeing the great future of hot water heating, made a special study of this depart-



M. D. Tillman, of the Honeywell Heating Specialty Co., Wabash, Ind.

ment. In connection with M. C. Honeywell, he organized the Honeywell Heating Specialty Co., and taking charge of the practical side of the business, has played an important part in the development that has gone on. A large portion of Mr. Tillman's time is devoted to experimenting and in evolving new ideas for the firm to put upon the market. He also travels extensively on business, covering in some years over 25,000 miles altogether.

Mr. Tillman, who considers himself half a Canadian, as he married a charming Toronto woman, highly appreciates the kind treatment that he has received at the hands of the trade generally. He is certain that there is a great field in the Dominion for anything in the line of manufacturing, and he means to secure some portion of it for his concern. Mr. Tillman is satisfied that trade prospects in Canada are of the brightest.

CONTRACTS AND BUSINESS OPPORTUNITIES

Waterworks and Sewerage.

The Rectory Street sewer, London, has been begun.

A number of sewers will be constructed in Owen Sound.

Sherbrooke Street sewer, Montreal, will cost \$72,000.

A waterworks system will be installed in Taber, Alta.

Work has commenced on Longueuil's, (Que.), sewerage system.

The sewerage and waterworks systems, Dartmouth, N.S., will be extended.

Nanaimo is expected shortly to begin work on its \$75,000 waterworks system.

Grandview residents are asking for an extension of Vancouver's sewerage system.

Arcola, Sask., ratepayers will vote on a by-law to raise \$60,000 for a water system.

A filtration plant will be installed at Kettle Creek, St. Thomas, for the sum of \$30,000.

The new conduit from Pt. St. Charles to Lachine, Que., will be completed by November.

Ottawa has offered \$55,000 to the Ottawa East Waterworks Co. for its system and plant.

Waterloo ratepayers have approved of a by-law to expend \$5,000 on waterworks extension.

Palmerston is drilling a waterworks well, and a water system will be installed shortly.

The waterworks and sewerage systems, Lunenburg, N.S., will be improved at a cost of about \$25,000.

Waterworks extensions will shortly be begun in Victoria, B.C., and sewerage extensions may also be undertaken.

Nanaimo ratepayers will vote on a by-law to construct a modern sewerage system at an estimated cost of from \$100,000 to \$125,000.

The council of Moose Jaw, Sask., is considering by-laws to the amount of \$150,000, for electric light plant, sewer and water systems.

The ratepayers of Listowel will on June 22 vote on the following by-laws: \$18,000 for electric light purposes and \$6,000 for the purpose of extending the water mains.

The ratepayers of Regina have carried the following by-laws: \$90,000 for waterworks, \$10,000 electric light purposes, \$70,000 for sewerage purposes, \$5,000 for sidewalks, \$25,000 for pavements.

Work is about to be started on the new waterworks extensions in Knowlton, Que. Two carloads of pipe joints and appliances for the new line have

been unloaded and the men have begun on the ditch and reservoir.

Public Buildings.

A new fire hall will be erected in Calgary.

A new postal station will be built in Montreal.

A new school house will be erected at Minto, Man.

A new public school will be erected at Kildonan, Man.

The Port Britain, Ont., school was burned last week.

An eight-room school annex will be built at St. John, N.B.

An addition will be built to the Orillia collegiate institute.

Montreal will spend \$43,000 on improvements to the city hall.

A company is being organized at Humboldt, Sask., to erect a public hall there.

Plans have been submitted for Meaford's proposed new town hall to cost \$17,500.

New armories will be erected on Rachel St., Montreal, at a cost of about \$90,000.

Dryden, Ont., ratepayers have approved of a by-law to spend \$3,000 on a school.

Branksome Hall Ladies' College, Toronto, will have a \$22,000 addition built.

St. Joseph's Catholic Church, Toronto, will be reconstructed at a cost of \$9,000.

The Church of the Sacred Heart, Ottawa, will be rebuilt, at a cost of \$103,000.

A new public school will be erected at Whitewood, Sask., to erect a public hall Whitewood, Sask.

Gilbert Plains, Man., ratepayers will vote on a by-law to spend \$15,000 for school improvements.

St. Alban's School for Boys, Toronto, will be removed to Weston, where a new school will be erected.

The plans have been accepted for Regina's new \$100,000 high school.

A home for aged and infirm women will be erected at Victoria, B.C.

The Woodstock, N.B., Board of Education will build a \$20,000 school.

The Sarnia collegiate institute will have a steam heating plant installed.

Cavers & McRae have the contract for building Zion Church, Carleton Place.

A new post office to cost about \$40,000 is proposed for Grand Forks, B.C.

John Saul, Winnipeg, has the contract for the addition to the Mulvey, Man., school.

The McCartney-Fowler Co., Regina, has the contract for the public school at Francis, Sask.

Winnipeg will submit to the ratepay-

ers a by-law calling for \$25,000 for a new fire hall.

Gilbert Plains, Man., ratepayers will vote on a by-law to raise \$15,000 for school purposes.

An addition will be erected to the Carnegie Library, Winnipeg, at a cost of about \$39,000.

General Building Notes.

St. Thomas building permits for May totalled \$31,325.

A new Y.M.C.A. building will be erected at Brantford.

Eight business blocks are being erected in Guernsey, Sask.

J. C. Murray is building a large office block at Fort William.

The "Eagles" are to erect a new building at Nelson, B.C.

J. B. Beveridge, Newcastle, N.B., will erect 25 dwellings there this summer.

H. A. Mullins, Winnipeg, will erect an apartment block, probably this season.

The Dominion Bank is building a \$7,000 addition to the branch at Gravenhurst.

The Bank of Nova Scotia is erecting a four-storey building on Melinda St., Toronto.

Saskatoon, Sask., has fifteen buildings, mostly dwellings, in course of erection.

D. Weismiller will erect 27 brick dwellings, to cost \$64,000, in Parkdale, Toronto.

Montreal's building permits for May numbered 156, representing a value of \$509,960.

The large Broderick summer hotel at Parrsboro, N.S., was destroyed by fire. Loss about \$10,000.

Toronto's building permits for the first week of June totalled \$230,000, mostly for dwellings.

Two new blocks are being built at Fort William by T. E. Dean and M. H. Bradem, and the second by R. D. Hawks.

Snyder Bros. Portage la Prairie, have the contract for the provincial reformatory at an estimated cost of \$67,000.

Plans are in course of preparation for a fine new Masonic Temple for London. The proposition is to erect a four-storey structure about 200 feet square.

Hamilton's (Ont.) building permits for May showed a falling off of \$309,550 as compared with May last year. The figures for the month were \$119,400 as against \$428,950 for the same month last year.

The new St. Andrew's Sunday School at Chatham, Ont., will cost \$8,000. A \$6,000 residence will be built for W. H. Taylor, and a \$4,000 apartment house will be put up by Dr. Jos. Tremblay, of Chicago.

American Foundrymen's Convention

About 2,000 Delegates and Visitors in Toronto Last Week Attending Conventions of Various Bodies in Connection With the Foundry Trade.

Toronto hotels were crowded with visitors last week attending the conventions of the American Foundrymen's Association, the American Brass Founders' Association, the Foundry Supply Association, the Associated Foundry Foremen, and another distinct body known as the National Association of Brass Manufacturers, including in its membership most of the makers of plumbers' brass goods in the United States. The latter body held its sessions at the King Edward Hotel while



L. L. Anthes, Toronto Foundry Co., Toronto, the Youngest Man and First Canadian Elected President of the American Foundrymen's Association.

the others held their meetings and had their exhibitions at the Industrial Fair Grounds.

On June 9 the twelfth annual convention of the American Foundrymen's Association was formally commenced the delegates, who, together with their wives, numbered about 1,500, visiting the Machinery Hall and the Process Building, where practically every process in the system of modern iron and brass foundries, from the reduction of the metal to its liquid state to the turning out of the finished product, was demonstrated.

The exhibition of molding machines was one of the most interesting features of the convention, and one which deserved the study of every Canadian foundryman, too few of whom were alive

to the advantage of attending the convention and exhibition.

Among the papers read before the American Brass Founders' Association was one on "The Outside Versus the Inside Man," by W. A. Porter, of Somerville, Limited, Toronto.

The success of the convention was largely due to the tireless work of the local Entertainment Committee under the leadership of L. L. Anthes, of the Toronto Foundry Company; Fred. Somerville, of Somerville, Limited; R. J. Cluff, of the King Radiator Co.; Peter McMichael, of the Dominion Radiator Co.; and W. P. Near, of Page-Hersey' Limited. Mr. Anthes has been an active vice-president of the Foundrymen's Association and deserves the honor of being the first Canadian elected to the presidency.

Fred. Somerville made a record for himself as a host by taking large parties of delegates to the Brass Founders' Association and Metal Workers' Club to the magnificent new brass plant of Somerville, Limited. Autos and tally-ho's were kept busy. The expression of one visitor from the States summed up the general opinion: "I'm going to build a new plant soon, and I've learned a whole lot here. I didn't expect to find such a magnificent plant in Canada."

Brass Manufacturers' Association.

The National Association of Brass Manufacturers held their semi-annual meeting at the King Edward Hotel on June 9 and 10, there being about 65 delegates present from all parts of the United States:

The officers of the organization are: President—C. J. Hills, of the Haydenville Co., Haydenville, Mass. Vice-president—Edward F. Neideken, of the Hoffman & Billings Manufacturing Co., of Milwaukee, Wis. Directors—Edward C. Register, of E. C. Register, Jones & Co., Baltimore, Md.; E. J. Seitz, Union Brass & Metal Manufacturing Co., St. Paul, Minn.; H. M. Hoelscher, of L. Wolff Manufacturing Co., Chicago; J. W. Sharp, jr., of Haines, Jones and Cadbury Co., Philadelphia; E. L. Strauss, Central Brass Manufacturing Co., Cleveland, Ohio; Wm. M. Webster, Commissioner.

Many papers were read and topics discussed, matters of interest to the trade, also modern methods of manufacture.

Among the more important things acted upon, and one which will appeal to the Canadian brass manufacturers particularly, was the amendment to the con-

stitution, enlarging their scope, so as to take in Canada. Heretofore, the association has not gone beyond the American borders and on previous occasions efforts to amend the constitution and enlarge their territory were not successful, but this has now been accomplished and a number of new members were taken into the organization, among them some Canadian manufacturers under the new and modified constitution.

The question of altering or changing the tests on brass goods were discussed and referred to a committee consisting of Messrs. Webster, Ryan and Hoelscher, with instructions to have same issued July 1st, 1909, and effective January 1, 1910, when likely the piece in lieu



R. J. Cluff, King Radiator Company, Toronto, Elected a Vice-President of the American Foundrymen's Association.

of the dozen lists will be used. This is left in the hands of the committees.

A special vote of thanks and appreciation was by rising vote extended to the Torontonians and to Mr. Fred Somerville, Toronto, especially for the very kind and hospitable, and courteous treatment received while in Toronto.

The meeting after a two days' session adjourned to meet in Detroit, Mich., Sept. 15 and 16th of this year.

CENTRAL HEATING PLANT.

The authorities of the University of Toronto are considering a proposal to heat the buildings from a central heating plant. The proposal is to erect the new plant near University College and convey the steam by means of underground pipes protected by asbestos. It is estimated that a plant of this kind would cost in the neighborhood of \$250,000.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, June 15.—The good progress noted in our last issue still continues, and plumbers generally report plenty of work in hand, and prospects for a continuance very favorable. Of course, there are some men who cannot speak so cheerfully of conditions. Undoubtedly the building trade has fallen off from last year, and up to now, less money is being spent in repairs and improvements. Some shops are consequently feeling the pinch somewhat. But it is not fair to pin comparisons upon last year alone, and those who are broad enough to extend their review over a number of years, are quite satisfied with things as they are. Although all plumbers are not busy, the majority are working full hours, while some of the lucky ones are putting in overtime. Outside Montreal, conditions seem more favorable than in the city. In the adjoining municipalities much residential property is going up, while in the country, helped, no doubt, by the magnificent crop prospects, plenty of work is offering.

Iron Pipe—Iron pipe has looked up decidedly within the last week or so, and some good orders have gone through. The booking is much heavier, and satisfactory business has opened up. A good feature of the trade is that most of the pipe is apparently being used, and not stocked. We continue to quote: $\frac{1}{2}$, $\frac{3}{4}$ and 1-inch pipe at \$2, \$2.25 and \$5.28 for black, and \$2.86, \$3.08 and \$6.93 for galvanized.

Soil Pipe—Users' stocks being on the light side combined with the increase in the building trade, soil pipe is making good progress. Plenty of pipe is being used in outlying districts, and while the city demand has fallen off somewhat, a fair quantity of material is being employed. The trade generally, therefore, is much better than it was, and with some fair-sized booking, manufacturers and supply houses are not dissatisfied. We continue to quote: Light, 3 to 6 in. 60 off; medium and heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

Lead Pipe—Trade maintains its improvement, and with other lines lead pipe is feeling the effects of the greater activity in the building trade. Some fairly heavy orders have been shipped, and users seem to be adding to their stocks. We continue to quote pipe and waste at 30 off.

Solder—Solder continues in good demand, and it is evident, as in the case of lead pipe, that consumers are augmenting stocks. We make no change in prices.

Enamelware—Enamelware has not yet felt the full effect of the increased activity in building, although a steady volume of trade is being done. Some bi-

contracts are expected to go through shortly, which will tend to move this line along. Prices are unchanged.

Brass Goods—With the firmness of copper there has been no disposition to cut prices any more. Standard lines are in fair demand, and as stocks in users' hands are not heavy, supply houses are hopeful of a much better call later on. Compression work still continues to be quoted at 65 per cent., and fuller work at 70 per cent.

Radiators and Boilers—Orders are heavier in these lines, although heating apparatus has not yet been stimulated to the extent that it will be when building is more advanced. We continue to quote radiators at 52½ off. Boilers and steamfittings are unchanged.

Metals—Copper maintains its firmness, but other metals have declined. We quote: Ingot copper, \$14.50; ingot tin, \$32; lead, \$3.60; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, June 8.—Continued improvement is noted in the trade generally, both city and country showing increased business over a fortnight ago. The city trade particularly is going ahead and the master plumbers are fairly well satisfied with what is doing. A great deal of roughing-in has been done this spring—more so than was anticipated—although the volume of business did not make the leaps and bounds of a year ago.

Iron Pipe—Small orders of increasing number rule. Stocks are fair, both supply and demand being good. Prices remain unchanged, \$6.93 being the quotation for one-inch galvanized, and \$5.28 the price for one-inch black. Cast iron fittings, too, are unchanged at 65, but malleable fittings are now quoted at 37½ off, instead of 35 per cent., a fortnight ago.

Soil Pipe—The city is naturally taking most of this line and the demand is more than fair. Prices are the same as quoted two weeks ago, light pipe, 60, and fittings 70 per cent.; medium and extra heavy pipe and fittings are still 70 per cent.

Lead Pipe—Orders continue small, but the business is by no means light, and supply and demand are very fair. Pipe and waste are still quoted at 30 per cent., and traps and bends 50 per cent. Caulking lead is quoted at 4½c per lb.

Solder—Business is fair with prices unchanged. For half-and-half 19e is asked, and for wiping solder 18c is the quotation.

Brass Goods—Very quiet business continues and prices for fuller and com-

TOWN OF OAKVILLE

PROVINCE OF ONTARIO

WATERWORKS AND ELECTRIC LIGHTING

NOTICE TO CONTRACTORS

Sealed tenders will be received by the Chairman of the Board of Water and Light Commissioners until 8 p.m. on

TUESDAY, JUNE 23RD, 1908,

for the following works:—

Contract "A"—Pipelining, 20,000 feet.
Contract "B"—Power House.
Contract "C"—Water Tower.
Contract "D"—Cast Iron Pipes and Specials.
Contract "E"—Fire Hydrants and Gate Valves.
Contract "G"—Electrically Operated Pumping Machinery.
Contract "K"—Electric Lighting and Power System.
Contract "L"—Sedimentation Basin.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay street, Toronto, or at Oakville, on and after June 15th. No tender necessarily accepted.

A. S. CHISHOLM, Esq., WILLIS CHIPMAN, C.E.,
Chairman of the Board, Chief Engineer,
Oakville, Ont. 103 Bay street, Toronto, Ont.

June 9th, 1908.

Sale of Brass Plant in Galt
BY TENDER

Sealed tenders addressed to "Melvin A. Secord, Solicitor for the Liquidator, Galt, Ontario," and marked "Brass Tender," will be received by the undersigned up till Saturday, the 20th day of June, 1908, at the hour of 12 o'clock noon, for the purchase of the real estate, buildings, plant, machinery, stock-in-trade and all other assets of the Canadian Brass Manufacturing Company, Limited, of which the following is a partial inventory:—

(a) Building and land.....	\$18,922 51
(b) Machinery, belting and tools	11,481 96
(c) Patterns.....	2,811 65
(d) Finished goods.....	3,871 60
(e) Raw material and partly finished goods..	3,007 96
(f) Office furniture.....	156 50

Tenders for items (a), (b), (c) and (f) must state a lump sum, while tenders for items (d) and (e) must state a rate on the dollar.

The plant will be sold as a going concern.

Copy of inventory, full of information and conditions of sale to which tenders must conform may be had, as well as the premises and stock inspected, upon application to the undersigned. No tender necessarily accepted. Dated at Galt, this 6th day of June, A.D. 1908.

MELVIN A. SECORD,

Solicitor for the liquidator, Box 511, Galt, Ontario.

pression work are unchanged, the former is at 70 per cent., and the latter at 65 per cent. Some talk is heard of prices being advanced on Kerr valves.

Enamelware—Business continues brisk and men in the trade believe that it compares favorably with what was done a year ago, everything taken into consideration. Prices are lower on rolled rim sinks, "A" quality now being quoted at \$7.20, and "B" at \$6.60.

Boilers and Radiators—This line is an excellent seller, considering the season, many boilers and radiators going out. Orders, though frequent, are small in the city and immediate neighborhood, but the west took three carloads of goods last week from one concern. Prices are unchanged from a fortnight ago.

A NEW INVENTION

Saves Money and May Save Lives

P. B. Bentley, of 70 Riverside St., Montreal has perfected a **NEW HYDRANT** which will be much sought by all the leading towns and cities of the Dominion. Send for description of this wonderful invention. **FULL DESCRIPTION OF IT GIVEN BY THIS PAPER.**

PATENT RIGHTS FOR CANADA FOR SALE. Write Me for Further Particulars.

THIS HYDRANT IS ABSOLUTELY NEW, and already the manufacturer is in negotiations with large cities like Montreal for complete equipment.

P. B. BENTLEY, 70 Riverside St., Montreal, Sole Owner and Patente.

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

Works at Valleyfield

If your nearest dealer does not handle our goods, write us.

DO YOU WANT A TRAVELLER?

Insert a "want ad." in **Plumber and Steamfitter** and you will have the satisfaction of knowing that your proposition will reach practically all the travellers for Plumbing and Steamfitting Houses in Canada.



THIS IS THE DAY OF

INVESTIGATION

Get in line and let us prove to you that the

GENUINE

Armstrong Stocks and Dies

ARE THE BEST.

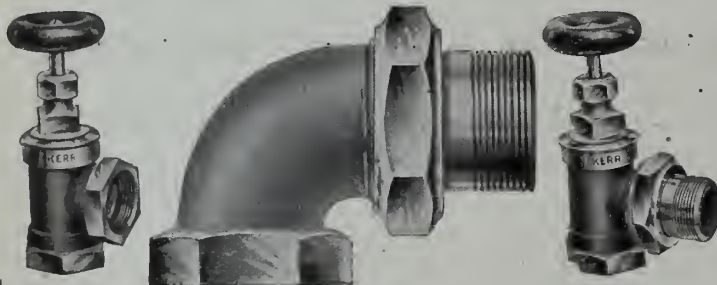
Catalogue on request.



The Armstrong Mfg. Co.

317 Knowlton St.

Bridgeport, - Conn.



Steam & Hot Water Fitters

who handle **KERR VALVES** are the leading men in their line.

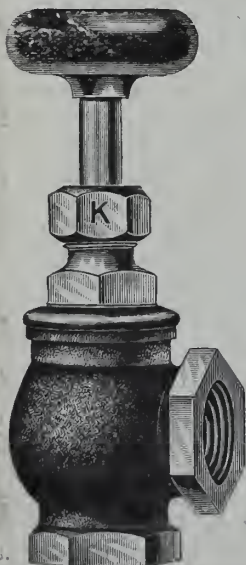
You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

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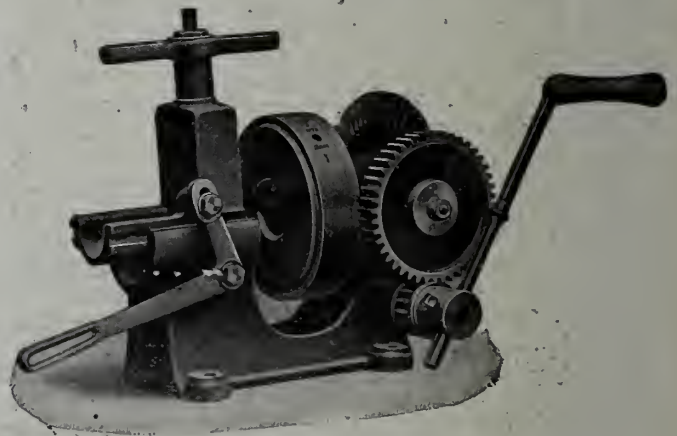
THE KERR ENGINE CO.
Valve Manufacturers
LIMITED

WALKERVILLE, ONT.



CHARLES WINN & CO.

Saint Thomas Works, Granville Street,
BIRMINGHAM, ENGLAND



WINN'S PIPE FITTER'S SCREWING MACHINE

New Model Fig. 1027

This screwing machine has been designed to meet the demand for a lighter and cheaper tool, suitable for sending out to jobs, and embodies the labour-saving features of the more expensive machines as far as is possible at the price, but the necessary economy has been effected without prejudice to strength and durability, the best material being used throughout.

Price £10 : 10 : 0 complete

With Adjustable Four-chaser Dies.

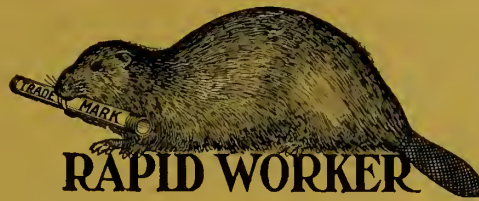
To screw tubes $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ 1 $1\frac{1}{2}$ 2 inch, also Bends $1\frac{1}{2}$ 2 inch
LIGHT AND STRONG.

Write for Full Particulars.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1 $\frac{1}{4}$, 1 $\frac{1}{2}$ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto



*Sovereign
Monarch*



We Want Every Steamfitter
to thoroughly examine

SOVEREIGN RADIATORS

and compare them with any other make. We know that such a comparison will result in greater sales of Sovereign Radiators because they are so manifestly superior in practical design. Not only have they a larger heating surface to the loop than other radiators but they also have a larger connection at the feed pipe.

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Head Office and Works: GUELPH, ONT.

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MONTREAL—122 Craig Street West
QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited
VANCOUVER, B.C.—Boyd, Burns & Company.

Plate F290



The Standard Ideal Company Ltd.

Drinking Fountains

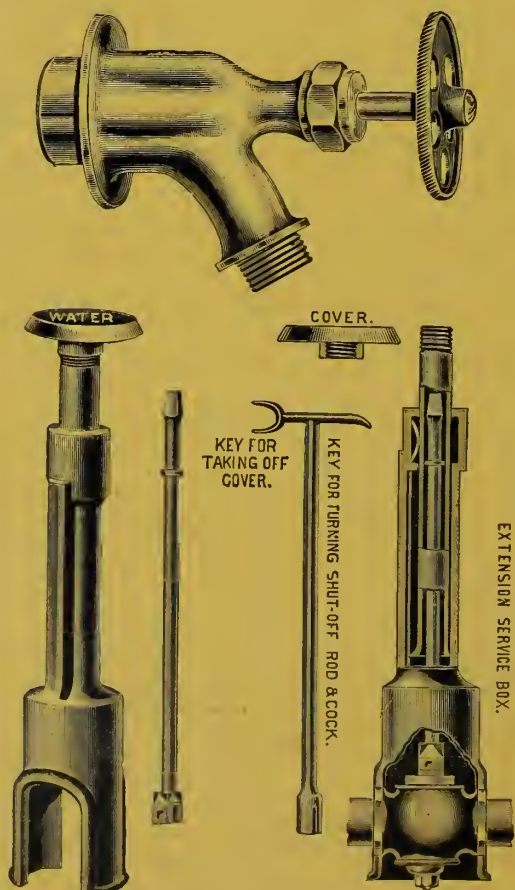
With the return of Hot Weather, the supply of fresh, pure, uncontaminated water (for drinking purposes) becomes a vital question for our Public Institutions, Factories, Colleges, Hotels, Large Retail Establishments, and Public Parks, etc., etc.

Our line of Drinking Fountains is just what is needed for the purpose.

We are in a position to supply these in various styles and would strongly recommend our "SANITAS" Fountain illustrated here.

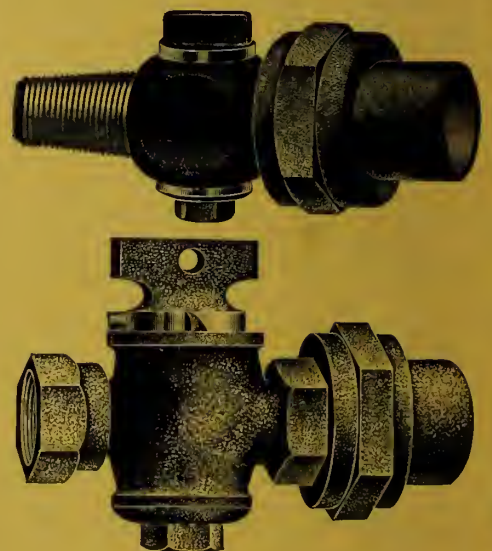
Head Offices and Factories, Port Hope, Ontario

Branch Offices and Sample Rooms: Toronto, 50 Colborne Street;
Montreal, 128 West Craig St.; Winnipeg, 156 Lombard St.



Fittings
That
Don't
Disappoint

For
Plumbing, Water, Gas and Steam



Hays Manufacturing Co.

Complete Works: . . . ERIE, PA., U.S.A.

PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

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WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 13. (New Series).

Publication Office : 10 Front St. East, TORONTO, JULY 1, 1908.

Old Series, Vol. XX. No. 13



THE 1908 DAISY

You would Never Send a Boy to do a Man's Errand. Then why expect to get from any other make of boiler a service that can only be performed by a Daisy? Over half a century ago the Daisy Blazed The Way to a successful hot water heating possibility. There are now over 30,000 in active service — more than All Other Makes Combined.

Maximum Heat with a Minimum Fuel Consumption — That's What Does It.

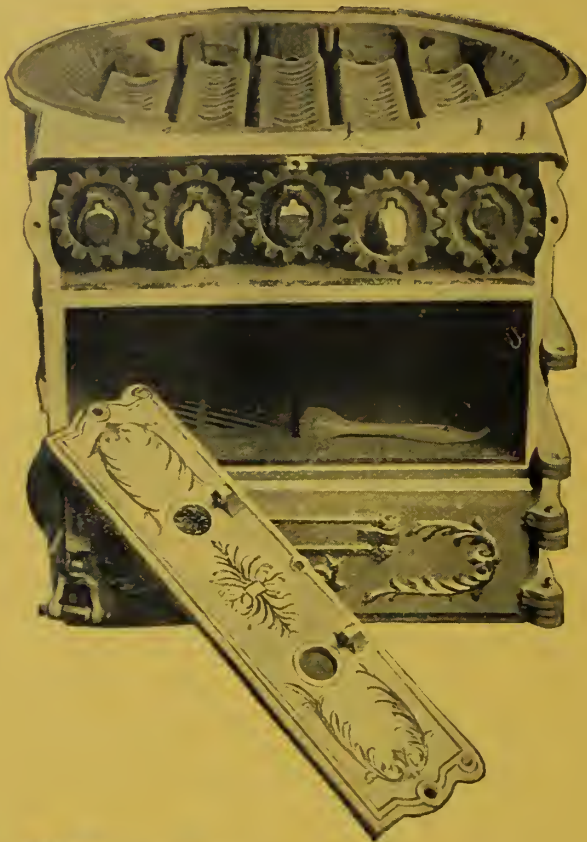
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CLUFF BROTHERS

Toronto

SELLING AGENTS FOR WARDEN KING, Limited

From Base to Smoke Opening

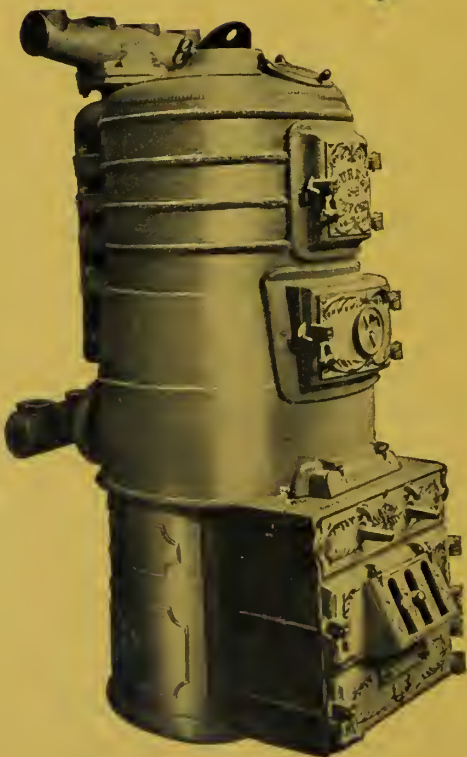


The Oxford Boiler is the best buy for you, your help and your customer—Removable, Revolving Grate Bars that are gear driven—no moving parts in ash pit—Bigger first section, and **more actual fire surface**, size for size, than any other boiler on the market—

Best of all, the push nipple joint, with a heavy iron nipple, will last forever—There's no rubber in the Oxford Boiler—The Oxford is heavier size for size, than any other Boiler—

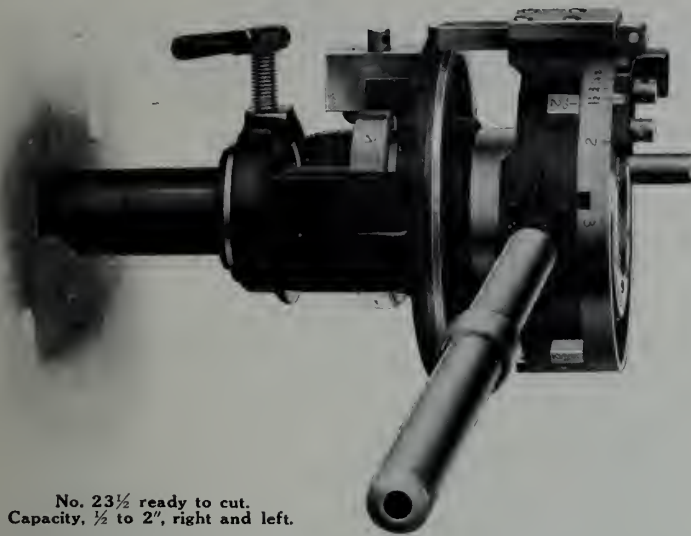
So when you buy it, you've done your customer justice—

We can supply you with absolutely "anything for heating" from the smallest jacket to the largest steam plant—Radiators in infinite variety—Prompt deliveries assured by stock at



Toronto, Montreal, Hamilton, Winnipeg, Calgary, Edmonton, Vancouver.

THE GURNEY FOUNDRY CO., LIMITED



The Narrow **EASY CUTTING DIES**

for
Threading Pipe

Without a Leader Screw

This is just one of the points in regard to the new

“BUCKEYE” DIE STOCKS

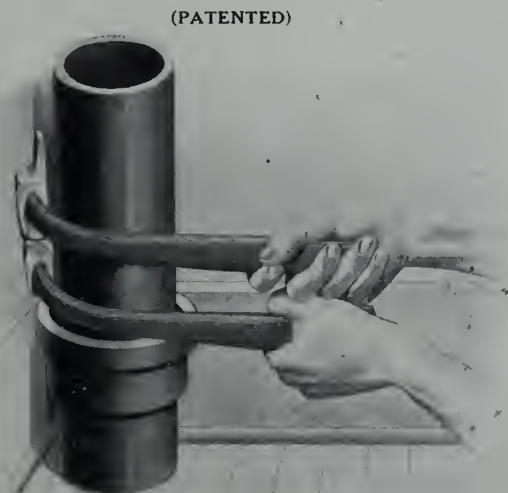
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The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

Mueller Combined Calking Tools

Restricted space results in restricted efforts, but with Mueller Combined Calking Tools you secure the same efficiency as if you had ample room. It's due to the curved handles and the combination of a hammer and calking tool into one article.

Made in Right and Left Calking Irons and Hammers and Right and Left Yarning Irons and Hammers. Sold separately, in pairs or by set complete. Unconditionally guaranteed.



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REGISTERED

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Works and General Offices
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Eastern Division
NEW YORK, N.Y., U.S.A.
254 Canal St. Cor. Lafayette.

Perfection in Water Closet Flushing

IS ATTAINED BY USING THE
KENNY FLUSHOMETER SYSTEM



Robertson's Acme Flushometer Combination. E.191.

Considerable improvements have been added which make the Flushometer the most perfect valve of its kind in use.

Used in some of the most prominent Hotels, Office and Public Buildings.

Recommended by all up-to-date Architects and Plumbers.

The James Robertson Co.

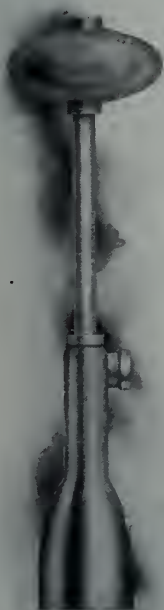
Toronto

Montreal

Limited

The Honeywell System of Hot-Water Heating

9,000 Systems in Use in America.



HONEYWELL
HEAT GENERATOR

We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

While our Canadian representatives will give their attention to making the trade on this side acquainted with the merits of the Honeywell System of Hot Water Heating and render engineering advice to the interest of the fitters, we will not fill orders direct for our specialties, but will supply the trade entirely through the established Canadian dealers.

The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



The Honeywell Heating Specialty Co.,

Plant and General Office, Wabash, Indiana

M. D. Tillman, Queen's Hotel, Montreal, Canadian Representative.

A Most Complete and Up-to-date Line of PLUMBERS' HOSE GOODS

MANUFACTURED BY

CANADIAN WOLVERINE CO.

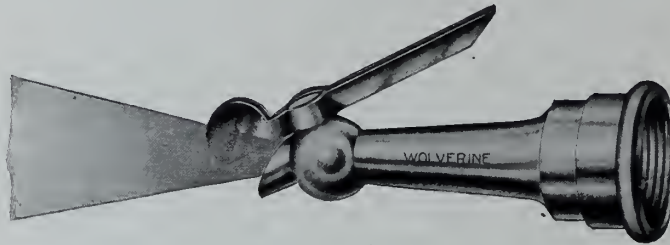
CHATHAM, - ONTARIO

HOSE NIPPLES



Hose thread on male end. I.P. thread on female end.

HOSE NOZZLE

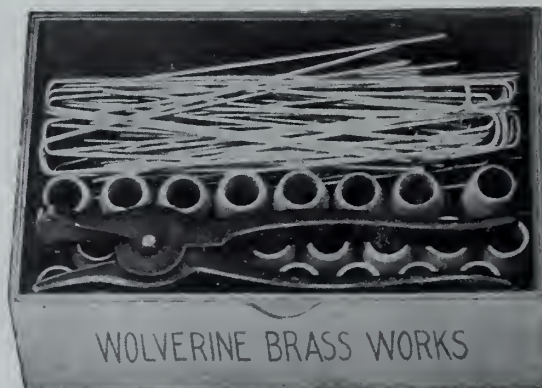


HOSE NIPPLES



Hose thread on one end. I.P. thread on other.

ECONOMY REPAIR SET



Each set contains 1 pair Combination Hose Pliers for both Caldwell and open end hose bands, 2 dozen 3/4-inch hose splices, 100 wire hose bands.

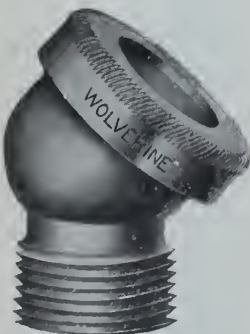
HOSE SPLICES



HOSE SPLICES



ROYLE
HOSE CONNECTION



For connecting 3/4-inch hose to plain bibbs.

HOSE PLIER



BIBB ENDS



To solder on the spout of a plain bibb.

RUSH ORDERS

SHIPPED SAME DAY AS RECEIVED. TRY AND SEE.

WRITE FOR

CATALOG "F" and DISCOUNTS.

CONFIDENCE

is the basis of all our commercial life. It enters into your home life especially in the matter of HEATING SYSTEMS.

Here is a letter that speaks for itself regarding our System.

TELEPHONE, EAST 2659

P.O. BOX 259

ALCIDE CHAUSSE

ARCHITECT
14-33
No 1024, ST. HUBERT STREET
MONTREAL

SUPERINTENDENT OF BUILDINGS OF MONTREAL
Member of the Province of Quebec Association of Architects, Institute of Architects of Canada, Society of Architects (England), Architekten-Verein zu Berlin (Germany), Maatschappij Tot Bewaarding der Bouwkunst (Holland), Society of Arts (England), The Royal Sanitary Institute (England), British Fire Prevention Committee (England), International Society of State and Municipal Building Commissioners and Inspectors, Comité Technique contre l'incendie (France), Permanent Committee of International Congresses of Architects, Cor. Mem. Société Centrale des Architectes Français (France), Société Centrale d'Architecture du Belgique (Belgium), Sociedad Central de Arquitectos de Madrid (Spain), American Institute of Architects (United States), Société Nationale des Architectes de France, Associate, Canadian Society of Civil Engineers, American Society of Civil Engineers, United States, etc.

Montreal, 3rd June, 1908.

Messrs. Record Foundry and Machine Company,
417 St. Paul Street,
Montreal.

Gentlemen:-

I have received a copy of your new book "Record Furnace Handbook" and I have read with much satisfaction, besides containing detailed information ^{about} the "Record" Heat Producers and Furnaces it is full of useful knowledge and tables of great value for Architects and all those desiring particulars on how to heat a house.

Yours very truly,

Alcide Chausse
Architect, Inspector of Buildings,
Secretary, Institute of Architects
of Canada.

The building necessity of modern times is SECURITY. When you have this, guaranteed with CONFIDENCE, there is little left to desire.

Our SYSTEM of HEATING is the evolution of YEARS of strenuous effort towards perfection. Let us tell you all about it by writing to-day for fuller particulars.

The Record Foundry and Machine Co.

Foundries at Moncton, N.B., and Montreal

Sales Agencies in Montreal, Toronto, Winnipeg, Calgary, Vancouver and St. John's, Nfld.

Plumber and Steamfitter and Sanitary Engineer of Canada

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Circulating amongst Plumbers,
Steam, Hot Water and Gas Fit-
ters, Sanitary Inspectors, Heating and
Ventilating Engineers, City Engineers,
Boards of Health, Architects, etc.

MONTREAL, TORONTO AND WINNIPEG, JULY 1, 1908

MONTREAL GETS NATIONAL CONVENTION.

Finding it impossible to make satisfactory arrangements for holding this year's convention at Quebec, and in the absence of an invitation to meet at Toronto, the executive of the National Master Plumbers' Association have decided to meet again at Montreal, where the trade is well organized and capable of looking after the details of the convention. A call will at once be issued calling the trade to assemble in the Royal City on Thursday and Friday, August 6 and 7.

While it is unfortunate that it was impossible to carry out last year's intention of meeting in Toronto in 1908 a gratifying report of progress in organization work in Ontario can be made by the Toronto and Ontario delegates to Montreal. While organization is not yet complete enough to warrant the Toronto trade in undertaking the arranging of a national convention, rapid progress is being made and there is every reason to believe that Toronto will be able to join with next year's National vice-president for Ontario in calling a provincial convention this fall. Outside of Ontario the impression prevails that the trade in this province is satisfied with existing conditions—and until action is taken to reorganize there is ground for this opinion.

A strong delegation from Toronto and other Ontario cities should attend the Montreal convention and work hard to secure next year's national convention for Toronto. Prevailing conditions are a standing reproach to the trade in Ontario and every effort should be made to remedy matters during the coming year. And there is no better method of uniting the trade than by getting the unorganized men to rub shoulders and exchange ideas with their brother tradesmen at national or provincial conventions.

Montreal master plumbers recognize the advantage of organization and presented a strong claim for this year's convention. Last year's gathering at Montreal, they pointed out, bore excellent results in Quebec province. All branches of the trade now work for a common aim—the advance of the trade on fair terms to all. This year the Montreal Association wants a large convention to impress upon the whole Province of Quebec the manifest blessings obtainable to its people if improved provincial legislation is enacted governing the quality and installation of plumbing and sanitary work.

Let every province in Canada send a strong delegation to Montreal this year and make the 1908 conven-

tion even larger and more productive of good than the 1907 and previous gatherings were.

LATER.—Just as the Plumber and Steamfitter goes to press word is received that the official call for the national convention will not be issued until about July 10, as a movement is on foot to arrange for the holding of the convention at Toronto. The Montrealers have the rail position and are jockeying for a start, but Toronto may yet win the event.

WINNIPEG MASTER PLUMBERS WIN.

As briefly announced in the last issue of the Plumber and Steamfitter, Winnipeg master plumbers won an important victory in the courts in the long-standing action against the Journeyman's Union for damages in connection with the strike two years ago. This case has aroused considerable interest among the trade in all parts of the country and the long-delayed decision awarding damages to the master plumbers, amounting to \$2,000, will give considerable satisfaction to employers in all parts of the Dominion.

The action was the outcome of the strike two years ago when the journeymen presented a schedule providing for an increase in pay. The masters refused to sign the agreement and a strike was at once declared. The decision of Mr. Justice Mathers affirms the right of the men to strike, but awards damages because of certain actions in connection with the strike. It was shown that the strikers induced non-union men to quit the shops and also induced men brought into the city on yearly contracts to break their agreements. In some cases it was shown that the strikers paid the fares of certain plumbers to induce them to leave the city.

During the progress of the strike there were meetings of the union at which minutes were taken, but these were not produced in court—a circumstance which counted against the defendants in the decision of the judge. During the strike an interlocutory injunction was granted against the defendants picketing and interfering with the working non-union plumbers. The decision of the judge makes the injunction perpetual.

The following is the conclusion of the judgment:—

"Of the defendants that came to trial I cannot find that the defendants Hartley and Gossling were active in promoting or carrying out any of the acts complained of. The defendant Hartley attended only one meeting at which he was outside guard, and he

appears to have known nothing about what was going on. Gossling was vice-president and presided at one meeting after the strike, but appears to have taken no other part. It does not appear that any of the things complained of was resolved upon at that meeting. This is not sufficient on which to hold him personally responsible. There is no evidence at all against the defendant Brown.

"All the other defendants who came to trial were active in promoting the strike and are individually answerable for the wrongs done: Krug Furniture Co. vs. Berlin Make, 50 L.R., 469.

"Whilst I am bound on the evidence to find that the defendants have broken the law and have thereby rendered themselves liable to damages, I must in justice to them, say that throughout the whole period of the strike there was no act of violence committed to either person or property, acts which in other strikes have brought discredit upon the cause of labor. And, with the one solitary exception before mentioned, only peaceable persuasion was used to induce men to quit work or not to begin work.

"As to the damage, it is somewhat difficult to assess. The defendants are not liable for the damages caused by themselves quitting work. They are liable for inducing those who remained in or afterwards entered the plaintiffs' employ to quit and for preventing others from doing so in the manner before stated. That the plaintiffs were seriously damaged by the strike and what followed it is beyond dispute, but the difficulty consists in distinguishing between the damage caused by the lawful and by the unlawful acts of the defendants. After giving the matter the best consideration I can, I assess the damages against all defendants at \$2,000, divided amongst the plaintiffs as follows: Duff & Flett, \$200; Thompson & Homer, \$100; Gates, \$400; Northern Plumbing Co., \$100; Green & Litster, \$300; Cotter Bros, \$800, and Daltre Charette & Co., \$100.

"There will be judgment against the defendants individually, except the defendants H. Hartley, Geo. Gossling and W. Brown, for \$2,000 and costs, and against those defendants who are representatives as representing all persons who on May 4, 1906, constituted the association known as the Journeymen Plumbers, Gas & Steam Fitters & Steam Fitters' Helpers Local Union No. 62, and declaring that the property and assets of the said association in the hands of such defendants or any or either of them or in the hands of any other person or persons or body corporate in trust or for the use of the said Local Union No. 62, or to which the said association or persons are beneficially entitled, are liable to satisfy the claim of the plaintiffs against the said representative defendants for damages and costs.

"The injunction must also be made perpetual restraining the defendants from persuading, procuring or inducing workmen to leave the employ of the plaintiffs and of conspiring or combining to induce workmen not to enter plaintiffs' employ, also from besetting or watching places where the plaintiffs or any of their workmen or those seeking to enter their employ reside or carry on business or happen to be with a view to compel the plaintiffs or said workmen to abstain from doing anything they or any of them have a lawful right to do, or from persistently following them or any of them."

MUST HAVE PRACTICAL EDUCATION.

With the development of sanitation, and the placing of plumbers and their work upon a much higher plane,

so far as skill and science are concerned, it is more than ever essential that a plumber shall be a well qualified man. Even the crusade that through the agency of this journal is being directed against the by-laws and inspection systems of our various cities, by bringing the search light of greater publicity upon plumbing methods, makes the necessity of qualification all the greater.

Undoubtedly the plumber of to-day is a sanitarian. He is now no mere wiper of joints or liner of tanks and sinks. He has to use his brains and his mechanical skill, to counteract those evils which admittedly attend shoddy plumbing. With the knowledge that infection can be transmitted through the agency of sewers, that typhoid and other germs may be carried from one house to another by imperfect construction, the plumber must plan, and plan intelligently—he must work skilfully and work well. He must possess a knowledge of the conditions under which plumbing may become a source of danger, and of the best systems of trapping and venting to be used to meet certain peculiar circumstances. In fact he must have theory as well as practice.

When we speak of theory we do not mean that the average plumber should wade through weighty text books, and cloud his brain with abstruse and profound principles which may be left to the advanced sanitary expert. But he should have a certain amount of book knowledge which cannot be picked up in the shop, and which will help him not only to understand the systems of plumbing that other men have put in but enable him to evolve systems of his own, and render the difficult problems that he may have to face so much easier of solution.

Neither is it essential that a plumber should have a high-school education to acquire that knowledge which his industry to-day is demanding. Of course it is naturally better to have this education if it does not affect his practical experience, or make him feel above the unimportant work of a shop which after all is essential to make a really practical man. But the man who has started out without this higher education can easily acquire that amount of knowledge which will make him competent to meet most difficulties, and be able to explain to those who are interested in his work the reasons why this thing and that thing are being done. Given the ambition to succeed in his trade, and an average amount of intelligence and application, the learning is easy. Most cities have now plumbing classes, and if these cannot be attended the necessary books are soon secured, and there are always more advanced plumbers who would be willing to spare a little free time in helping another over a stile.

Most authorities seem to agree that a plumber should possess at least a working knowledge of mechanical drawing, chemistry, mechanics, hydrodynamics, and arithmetic. He should, as we have said before, possess a fair knowledge of the conditions under which, owing to infection being liable to be carried through the sewers, plumbing may be unsafe, and to the soundness of the system of trapping and venting.

Seriously grappled the subjects are not very hard to the young man who wants to succeed in his trade. It is hard for any one, after a laborious day's work, to have to settle down to a night of study. But the result is worthy of the labor, and the man who can plan and execute and can give convincing reason for his designs, is the man of the future. Plumbing is being elevated to a higher plane, and this entails responsibilities on the part of those in the trade, and demands a higher intelligence in the execution of their work.

Drain Air and its Effect on Public Health

By J. J. Cosgrove, in the Plumbers' Trade Journal.

Since the fourteenth century, when, according to an old record, "the refuse from the king's kitchen had long run through the great hall in an open channel, to the serious injury of health and danger to life of those congregated at court," the belief that "sewer gas," or the combination of gases arising from drains and cesspools, is injurious to health and dangerous to life has prevailed; and whenever an epidemic of disease visited a community, up to within recent years, a searching examination was made of the drainage systems within buildings and in a vague way the plumbing work was hinted at as being the direct cause of the visitation. In the early stages the statement usually took something like the following form:

Now here is a removable cause of death. These gases which so many thousands of persons are daily inhaling, do not, it is true, in their dilute condition, suddenly extinguish life. In their dilute state, as they arise from so many cesspools and taint the atmosphere of so many houses, they form a climate congenial for the multiplication of epidemic disorders and operate beyond all known influences of this class in impairing the chances of life. (Simon, 1849).

After Pasteur's classic studies into the causes of disease, when sanitariums became familiar with the manner in which epidemics are spread, the "climate congenial for the multiplication of epidemic disorders" give way to the theory that diseases, such as typhoid, diphtheria and scarlet fever, were transmitted from defective drainage systems by the liberation of the specific bacteria of the disorders, and thus the plumbing work within the building was looked upon as a very dangerous channel of infection.

Sewer Gas Danger Exaggerated.

Each belief in turn served the useful purpose of calling attention to the value of a clean environment and went far toward furthering the present-day sanitary condition of cities and homes. Having outlived their usefulness, however, it is well to look carefully into the matter and see how little or how much each factor contributes to the cause or spread of disease. As a matter of fact, there are good reasons for believing that the danger from sewer gas, or drain air, is greatly exaggerated. Of course, there are conditions under which drain air might be a contributing cause

of illness, but so far as being a specific channel of infection is concerned, there is absolutely no danger. Many examinations have been made of the air of sewers, both as to chemical composition and the bacterial content.

Miquel, who gave the matter the most study from a bacterial standpoint, found that the air of the Paris sewers contained a far less number of bacterial than did the air in the streets of Paris. A little reflection will show that these results might have been expected, for the air of sewers is comparatively quiet, consequently there is no agitation to keep the micro-organisms suspended in the atmosphere. Furthermore, bacteria cannot leave liquids or moist surfaces, so that the only surface from which they can be carried by the drain air is the narrow strip on each side of the sewer, between the high water mark and low water level. During low water, after this surface has dried, bacteria may be detached, as they also may from splash spots on other parts of the sewer.

Air in Sewers and Streets.

The number of bacteria and molds per cubic meter found in the sewers and above the streets of Paris by Miquel during the four seasons of the year may be seen in the following table of comparisons:

	Air of sewers		Air of streets	
	Bac.	Moulds	Bac.	Moulds
Winter ..	2,385	4,050	3,210	599
Spring ..	7,165	2,330	11,085	865
Summer ..	5,110	2,730	12,070	2,340
Autumn ..	5,400	1,550	7,365	2,320
Mean ..	5,105	2,665	8,435	1,530

While the number of bacteria in the air of sewers is much less than in the air of streets of a city, in theatres, churches, passenger coaches or other places where large numbers of people assemble, there is no reason to believe that the bacteria are of a more harmful kind. It is true that sometimes the sewage flowing through drains is infected with the specific bacteria of disease, but these infections are comparatively infrequent and there is no reason to believe that of the comparatively few present, any appreciable number find their way into the air. Of the few which do, it is questionable if any of them would succeed in passing through existing leaks into the living rooms, and if they did, no evil would result,

unless they actually found entrance into an individual who was susceptible to their poison.

So far, then, as specific infection of a house, with the bacteria of disease by way of the drainage system is concerned, there is so little danger that it may be ignored. It must not be assumed, however, that because of the immunity from that source, vigilance can be relaxed and the usual safeguards dispensed with. Bacterial diseases are only one class of ills that flesh is heir to; only one kind of poisoning and sometimes the least insidious. Even though the air of sewers and drains is free from bacteria, it must still be excluded from the home, or admitted at peril of health or life.

Drain Gas Ever Changing.

To be accurate, there is no specific gas which can be called "sewer gas." No characteristic and fairly uniform formula for drain air like there is for illuminating gas or boiler-flue gas. The air of sewers and drains which is usually designated by that name, is an ever-changing combination of gases, some harmful, others uninjurious. The real drain gases are the gaseous products of fermentation and decomposition and change in quantity and quality according to the presence or absence of air, kinds of bacteria, temperature and period of activity. The usual products of this breaking down of organic matter in the sewage, with which sanitarians are especially concerned in these days, are carbon dioxide, sulphureted hydrogen and ammonia compounds.

Carbon dioxide is the gas which gives to champagne and other sparkling beverages, their sparkling qualities. Carbon dioxide is best known to the public as the gas with which soda water is charged at the soda water fountains. This gas can be ingested with solid or liquid food, without experiencing any ill effect, but when mixed with the atmosphere in the proportion of 5,000 parts of gas to 10,000 of air and inhaled, will cause death in a very few minutes. It is generally accepted that when exposed to the effects of carbon dioxide, even in the low proportions of 150 parts in 10,000, for a considerable period of time, the result will be injurious to the system and if drain air containing carbon dioxide were permitted to flow into a living room until that percentage of gas was present, there is little doubt but that prolonged exposure in the room would prove injurious. As a matter of

fact, however, no such percentage of gas is ever present in a sewer.

Thus, Carnelly and Haldane give the results of a number of analyses of air from London and Dundee sewers, in which the determinations were made for carbon dioxide, and micro-organisms. They found that the amount of carbon dioxide was about twice as great as in the air outside and that the number of micro-organisms was less. It might be well to state in this connection that good air contains but three parts of carbon dioxide in 10,000 and normal air four parts of carbon dioxide in 10,000.

Boston Sewer Examined.

In this country, Professor R. W. Nichols found as a result of a number of analyses of the air of the Berkeley St. sewer, Boston, that the carbon dioxide varied from 8.65 parts per 10,000 in winter, to 23.95 parts per 10,000 in the warm months. The air of the Berkeley Street sewer was examined, because that was the poorest ventilated sewer in the city. The sewer is of brick, six feet in diameter, 3,500 feet long, is tide-locked, and contains but four perforated manholes for ventilation. The results of these two examinations can be taken as a fair indication of the worst conditions, so far, it must be remembered that in Great Britain the sewage is of twice the strength of the average sewage in America.

The air in the house drainage system, particularly when cut off from the street sewer by means of a main-drain trap, and provided with a fresh-air inlet, must be much purer than that of trunk sewers. There is no experimental analysis to confirm this belief, but, if the system is rightly proportioned that condition should obtain. Assuming, however, that drain air of the full strength of the street sewers were permitted to escape into the living rooms of a house, no matter how objectionable the drain air might be, no evil effect would follow, which would be due entirely to the carbon dioxide.

The natural constituent of drain air, which, if in sufficient quantity, would prove most dangerous or fatal, is sulphureted hydrogen. Sulphureted hydrogen consists of two parts hydrogen to one of sulphur, and is the gas which gives to rotten eggs, also to sulphur springs their characteristic odors. In quantities so low as 10 parts of the gas to 10,000 parts of air sulphureted hydrogen proves fatal to the lower animals, and when the proportions are as high as 50 parts of the gas to 10,000 of air, the effect is almost instantaneous, death being painful, and preceded by violent convulsions. Fortunately, however, the percentage of sulphureted hydrogen in drain air seldom or never reaches the

danger limit, a trace being all that ordinarily is determinable.

Leaks Into the Home.

So far, then, as the natural constituents of drain air are concerned, there is no danger to health, nor appreciable lowering of vitality due to the leakage of small quantities into the home; large quantities of the two dangerous gases, however, when in sufficient quantity and operating for a sufficiently long time, might, and no doubt would, bring about a lowering of the vitality which would render the subject more susceptible to disease. For instance, Dr. Alessi, at the University of Rome, to determine the influences of foul gases upon animals subsequently inoculated with typhoid culture, placed a number of rats in a wooden box with a wire bottom, over the aperture of an untrapped water closet.

A number of guinea pigs and rabbits were likewise boxed and placed over a vessel which contained excrementitious matter, while an equal number of control animals were kept under normal conditions. The following table gives the result of the experiments mentioned above:

EFFECT OF FOUL AIR ON ANIMALS.

Series of Experiments.	Culture used for inoculating the animals.	Kind and number of animals inoculated.	Percentage of Mortality Among Animals Inocul'd.	
			Animals exposed to foul gases previous to normal inoculation	Animals kept under normal condition.
First	Typhoid	122 guinea pigs	75.5	7.3
		90 rats	72.2	0.0
		18 rabbits	100.	0.0
Second	Typhoid	16 guinea pigs	77.8	0.0
		14 rabbits	87.5	0.0
Third	B. Coll Communis	22 guinea pigs	83.3	0.0

The conditions under which these experiments were conducted, however, are extreme and cannot be compared with the slight amount of air which, escaping from a defective drain into a room, would be unlimitedly diluted by the air in the building. In the experiments the animals were kept under abnormal conditions, not allowed to lead normal lives, and they were confined in inverted boxes where the carbon dioxide from their own respiration, having no means of escape, was added to the already overcharged air,

Further, it must be remembered that in Europe where Dr. Alessi's experiments were conducted, the per capita amount of water consumed is equal to about one-third of the per capita con-

sumption in this country, therefore the sewage would be proportionately stronger and the gases arising more concentrated and more weakening to the animals. Nevertheless the experiments point out strikingly the harmful effect of breathing foul air.

Guard Against Carbonic Oxide.

If the natural constituents of drain air were all that had to be considered, the proposition could be laid down that drain air was practically harmless; and the immunity from disease of men who work in sewers and around sewage works could be cited to prove the case. There are conditions, however, under which drain air becomes highly charged with carbonic oxide and the escape of this gas into the dwellings must be guarded against.

Very few people there are who cannot remember the pungent smell of illuminating gas experienced when passing an open trench in a city street. The presence of this order is not surprising when it is considered that in New York City, from 600,000 to 1,000,000 cubic feet of gas per annum per mile of main is lost by escaping from the pipes, and in other cities corresponding losses are experienced ac-

cording losses to size of mains. This gas enters the porous earth and finds its way into sewers, drains, basements, cellars and other cavities which are not impervious.

In the summer time and in streets which are not paved, asphalted or otherwise made almost impervious, some of the gas escapes to the air; but on paved streets, like those of most cities, the gas percolates into street sewers and into the cellars and basements of buildings. It is quite a common experience to read of the explosion of "sewer gas" in a sewer manhole, hurling the manhole cover high in the air, but this deadly "sewer gas" is nothing but illuminating gas, which having infiltrated into the sewer and become mixed with a certain

percentage of air becomes highly explosive.

Majority of Cities Affected.

The presence of carbonic oxide in sewers is more likely to occur in cities where carbureted water gas is used; but as in comparative few places the old-fashioned process of coal distillation is adhered to, it may safely be said to take place to a greater or less extent in the majority of cities. Sometimes the illuminating gases are not filtered out of the carbureted water gas and the entire fluid finds its way into the sewers. When this occurs, the presence of danger is readily detected by the sense of smell, whereas carbon oxide has no odor and there is no simple test for determining its presence when the odorous gases are removed or filtered out.

The presence of carbonic oxide in the drainage system or in the house is objectionable on account of its inflammable character, but is thrice more objectionable on account of the fatal effect of the gas when inhaled in small quantities. It is generally accepted that .2 of 1 per cent. of the gas is very bad, and that .4 of 1 per cent. is quickly fatal. At all events, experiments have demonstrated that rabbits die in $4\frac{1}{2}$ minutes when exposed to an atmosphere containing 4 per cent. of the gas and no doubt much weaker mixtures would prove fatal if allowed to operate a sufficient length of time.

Of course, it is always a question if that quantity of gas would ever escape from a defective drainage system into the house for, at the proportion of .2 of 1 per cent., 2 cubic feet of the gas would have to escape into a room 10x10 feet in order to be serious, and 4 cubic feet would have to be present before the danger limit would be reached.

Present Drain Traps a Security.

It is safe to say that with our present system of interposing main drain traps in the house drain, there would be no danger from this source. Carbureted water gas, which usually contains about 30 per cent. of carbonic oxide, is almost as dangerous to life as is the carbonic oxide. A 5 per cent. mixture of water and coal gas will prove fatal to rabbits in 30 minutes and no doubt human beings could not survive a much longer period in a mixture of equal strength.

It would seem from the foregoing consideration of the subject that the danger from drain air is more fancied than real, and that the greatest danger arises from extraneous causes not part of the drainage system. Lately this danger has been augmented in the larger cities by the emptying of gasoline into the waste pipes at garages and the fumes

of the gas, while comparatively harmless so far as respiration is concerned, are exceedingly inflammable and if they cannot be kept out of the public sewers should at least be excluded from the drainage system within buildings.

So far it would seem that the greatest safety yet interposed is the main

drain trap, which should be retained in cities exposed to the danger of illuminating gas or gasoline until some better contrivance can be found, or until the real harmful gases in sewers and drainage systems, gasoline vapor, illuminating gas and carbonic oxide can be neutralized or excluded.

The Smoke Test for Completed Plumbing

Paper Read by H. J. Luff, Sanitary Engineer, Cleveland, Before the American Society of Plumbing and Sanitary Engineers.

The master plumber who by the expenditure of marvelous energy succeeds in getting the city council to pass a "Code of Building Sanitation," or "Rules and Regulations Governing Plumbing and House Drainage," requiring extra heavy cast iron house drains, soil and waste pipe stacks thoroughly ventilated, and a sentinel at every trap in the shape of a back vent pipe, perfectly constructed traps, threaded cleanout openings and solid brass cleanout plugs, and a multiplicity of details too numerous to numerate in the scope of this paper, and then fails to provide for a reasonable assurance that the results striven for have been attained, is certainly lacking in consistency.

Objections Raised to Smoke Test.

Some of the reasons given by master plumbers for opposing the final smoke test are: 1. That the smoke test might reveal a leak at such a point that it would be difficult and expensive to repair it. 2. An enemy would take advantage of this requirement and maliciously damage the work after the roughing in test was made and thereby cause a great loss. 3. It is an unnecessary expense, as we are reasonably sure that the work is all right.

Answering the first, if ordinary care were used in the choice of materials for construction, using such materials that would be the least liable to damage by other trades and properly supporting the piping at the base and at reasonable distances, there is little likelihood that a leak will be present, after the roughing in test has been made. To the second objection I would call attention to the fact that there is abundant opportunity for an enemy to damage waste and supply pipes were he so disposed, and of necessity these would have to be repaired. Third, the expense is so slight compared with the advantage gained of giving the assurance to the occupants of the building that it is in perfect condition (and without this test

it is impossible to do so) that this reason is hardly worth consideration.

The air test might demonstrate that the system is free from leaks but what assurance does it give that the vent lines are clear, or that there is no double trapping? The same might be asked of the peppermint test.

After the greatest care has been taken to install a perfect system there still remains the possibility that the following imperfections may exist which are not revealed by the ordinary use of the system:

The vent lines may show an interior defect, such as filming over of the galvanizing, or when they are of lead may show that the carpenter or lather has damaged them in performing his part of the work, and the same may occur to the upper portion of the lead bends. And when the work has been performed by the careless plumber of which there are a few in most large cities, these added imperfections may exist which the ordinary use of the system would not reveal.

What Smoke Test Discovers.

Double trapping of fixtures, traps imperfectly set so as not to retain a seal, traps omitted where they should be placed, joints broken through settlement or shrinkage, imperfectly connected floor joints of earthenware fixtures, imperfectly connected wall connections, defective closet or urinal bowls, unused fixture connections not properly sealed, vent pipes stopped through carelessness in leaving them plugged, or allowing building material to be dropped into them, traps siphoning through the frictional resistance of too many elbows in vent pipe, or too small size vent pipe, or too long lengths of vent pipe, all of the above I have found to exist in an experience covering many years in actual experience in smoke testing old and new buildings. As to the effects of the presence of sewer air on the occupants of a building the concrete illustration which follows in the two letters

addressed to me is worth more than all the theorizing imaginable.

April 28, 1904.

Dear Sir: In reference to work at Chandler & Rudd's store, 2279 Euclid Avenue, preliminary examination of plumbing after defects had been ascertained by the smoke test and before any changes or repairs had been made were as follows:

One end of 4-in. sewer left open in cellar bottom.

Three 4-in. iron pipes left open with ragged ends.

One 4-in. iron trap old connection to closet left open and seal evaporated.

Two 2-in. refrigerator wastes abandoned and ends left open and seals of traps evaporated.

One 2-in. sink waste end left open just below first floor.

Three 2-in. back vent ends left open.

Fish box waste discharging into a 4-in. trap in the earth with no means of getting at it to clean out.

Meat cooler, butter cooler, milk cooler and two oyster coolers, with open ends discharging into an open pipe above a 4-in. trap, with a broken sewer connection within 1 ft. of these pipes, the sewer air circulating between these coolers.

Black iron vent pipes:

Final examination: All of the sewer and soil pipe openings properly sealed, and all cooler waste pipes double trapped, absolutely preventing any sewer air from getting into the coolers, and preventing any circulation of air from one to the other and cleanouts placed so as to be able to thoroughly clean out waste pipe. All done in the most approved manner. Smoke test showed that the drainage system was free from any leakage and the traps properly placed and of perfect seal.

The black iron pipe is allowed to remain with the understanding that it is not to be used for more than two years.

J. J. O'Neil.

Chief Plumbing Inspector, Cleveland, Ohio.

Cleveland, Ohio, Aug. 15, 1905.

Dear Sir: After entering our store at 2279 Euclid Avenue and previous to the testing and repairs to our plumbing made by you, about one year ago, we had a great deal of sickness among our employes, several being absent at one time, but since that

time we have had no sickness worth mentioning, one case of mumps being all that we have had since that time, about 15 months ago.

The Chandler & Rudd Company,
W. W. Ramsdell, Mgr.

Proper Methods of Making Test.

The first essential is a thoroughly practical machine of which there are a number on the market. A hose connection with interior wire protection of not less than 1½ in. diameter should be used. If oily waste or tar paper or other material that generates smoke through fire (as distinct from chemically produced smoke) is used, great care should be taken to keep the flame out of the system, as frequently combustible gases are present, where gasoline or turpentine, etc., have been poured down the fixtures by decorators, and the result has been explosions blowing the seals of traps up to the ceiling and over the walls and blowing the plugs out of the roof pipes. The machine should be attached preferably to the fresh air inlet, if there is one, and if not, to the house sewer just inside the sidewalk, or if this is inconvenient, to a down spout connection or a roof outlet. The water should be turned off and fixtures discharged so as to insure a clear opening throughout the system. The smoke should then be pumped in until it comes out of all the untrapped roof connections and then these connections capped. If there are any leaks these should be quickly stopped either permanently with cement if it should be the connections between iron and crock sewers, or temporarily with putty so as to ascertain all the defects before starting to make repairs. After the machine registers the system free from leaks, the fixture traps should be drained to ascertain if the smoke has been close up to the trap seal. If there is no intercepting or main trap it will, of course, be necessary to dig down to the house sewer and plug it up while this test is being made, or if there is a Y and cleanout just inside the building it can be plugged from this point, and if the hose is of sufficient length to allow of the machine remaining on the outside, this point makes a good point to attach the hose. It can readily be seen that such a test made in the manner described will show up all of the defects that might exist, and no stretch of the imagination can possibly credit the air of peppermint test with being anything but a farce for a final test.

John McKelvey, senior partner of the firm of McKelvey & Birch, plumbers, of Kingston, has gone to Atlantic City to spend some weeks for the benefit of his health.

A NEW PIPE CUTTER.

A new pipe cutter designed to meet the demand from those who prefer a cutter with solid frame instead of the usual quick adjustment, has been placed on the market by the Armstrong Mfg. Co., of Bridgeport, Conn. This cutter is likely to be very popular with the trade.

GLASS BATH TUBS.

Two glass bath tubs, together with some glass lavatories, were some time ago imported from Germany by the Peck Bros. & Company, New Haven, Conn., as an experiment. Only one of the tubs reached the company's show room in good condition, and was exhibited both in New York and Boston. The tub which was broken had apparently been handled with a great deal of care. Knowing that these tubs would give an unequal expansion when subjected to hot and cold water, the firm refused to guarantee them, although the makers claimed that they were annealed so as to withstand the strain. This lack of confidence in the glass tub was apparently well founded, for when it was presented to a hospital in Boston the action of water at varying temperatures proved too much of a strain on the tub and its bottom fell out after it had been in use only a few days.

WATER TUBE BOILER.

E. E. Larrabee, Williamston, Mich., has invented a boiler of the water tube type and arranged for generating steam or for use in hot water heating systems for heating the water. The boiler tubes are arranged to provide the easiest and quickest means of circulation and to provide a large heating surface in a small space.

AN IMPROVED HYDRANT.

George Payne and John Ross, Orillia, Ont., recently obtained a Canadian patent for an improvement in connection with a water hydrant, and are having the article manufactured by the James Robertson Company, Toronto, on royalty. The improvement is an anti-freezer, and consists of two valves, the lower one above the intake, and the upper one above the outlet branch. The two valves are connected by one screw rod, which is held in position at the lower end by a nut. When the rod is turned one way the lower valve is unseated and allows the water to pass through the hydrant. When it is desired to shut the water off, the rod is turned in the opposite direction and then the lower valve is seated and the upper valve is unseated, allowing the standing water to leak out and thus preventing freezing.

Regulations for Ventilating Schools

Laws Passed by the States of Massachusetts, New York, New Jersey and Pennsylvania Governing the Heating and Ventilation of Public Buildings.

Various States of the United States have for some time recognized the importance of the proper ventilating and heating of school houses, and several of them have placed on their statutes regulations covering this work. The necessity for such regulations exist here in Canada, and it is to be hoped the proper authorities will be quick to recognize this necessity, as light and ventilation are the great enemies of disease. Much has been said and printed of late concerning the safeguarding against tuberculosis and the stamping out of this dread disease. There is no better place to begin than by seeing that the child at school is provided properly ventilated school rooms in every municipality, and the following, reprinted from the Heating and Ventilating Magazine, is instructive reading:

Laws regulating the ventilation of schoolhouse buildings are in force in four states, namely: Massachusetts, New Jersey, New York and Pennsylvania. The requirements in Massachusetts went into effect in 1894. After a lapse of nine years a ventilation law was passed in New Jersey, containing practically the same requirements as the Massachusetts regulations. New York next fell into line in 1904, and its action was followed, in 1905, by the passage of a ventilation law in Pennsylvania.

With the exception of the Massachusetts requirements, the ventilation laws in force in this country are the direct result of the work of members of the American Society of Heating and Ventilating Engineers.

MASSACHUSETTS VENTILATION LAW.

The ventilation requirements in Massachusetts are provided for in an act entitled "Of the Inspection of Buildings" (Acts of 1902), Chapter 104, Revised Laws of Massachusetts, Sections 22, 23 and 24; and Chapter 106, Revised Laws of Massachusetts, Sanitary Provisions, Sections 54 and 55. These sections read as follows:

Chapter 104, Revised Laws of Massachusetts—Section 22: No building which is designed to be used, in whole or in part, as a public building, public or private institution, schoolhouse, church, theatre, public hall, place of assembly, or place of public resort, and no building more than two storeys in

height, which is designed to be used above the second storey, in whole or in part, as a factory, workshop, mercantile or other establishment, and has accommodations for 10 or more employes above said storey, and no building more than two storeys in height, designed to be used above the second storey, in whole or in part, as a hotel, family hotel, apartment house, boarding house, lodging houses, or tenement house, and has 10 or more rooms above said storey shall be erected until a copy of the plans thereof has been deposited with the inspector of factories and public buildings for the district in which it is to be erected by the person causing its erection, or by the architect thereof. Such plans shall include the method of ventilation provided therefor, and a copy of such portion of the specifications therefor as the inspector may require.

Section 23: No wooden flue or air duct for heating or ventilating purposes shall be placed in any building which is subject to the provisions of Sections 24 and 25 (the sections refer to buildings such as those already described, coming under the inspection of the fire inspectors), and no pipe for conveying hot air or steam in such building shall be placed or remain within one inch of any wood-work, unless protected to the satisfaction of said inspector, by suitable guards or casings of incombustible material.

Section 24: Whoever erects or constructs a building, or architect or other person who draws plans or specifications, or superintends the erection of a building, in violation of the provisions of this chapter, shall be punished by a fine of not less than \$50 or more than \$1,000.

Chapter 106, Revised Laws of Massachusetts, Sanitary Provisions.—Section 54: Every public building and every schoolhouse shall be kept clean and free from effluvia arising from any drain, privy or nuisance, shall be provided with a sufficient number of proper water closets, earth closets or privies, and shall be ventilated in such a manner that the air shall not become so impure as to be injurious to health. The provisions of this section shall be enforced by the inspection department of the district police.

Section 55: If it appears to an inspector of factories and public buildings that further or different sanitary or ventilating provisions, which can be pro-

vided without unreasonable expense, are required in any public building or schoolhouse, he may issue a written order to the proper person or authority directing such sanitary or ventilating provisions to be provided.

A school committee, public officer, or person who has charge of, owns or leases any such public building or schoolhouse, who neglects for four weeks to comply with the order of such inspector, shall be punished by a fine of not more than \$100.

Whoever is aggrieved by the order of an inspector issued as above provided, and relating to a public building or schoolhouse, may, within 30 days after the service thereof, apply in writing to the board of health of the city or town, to set aside or amend the order; and thereupon the board, after notice to all parties interested, shall give a hearing upon such order, and may alter, annul or affirm it.

Inspection.

Acting under the authority of this act, the district police caused the following order to be issued, which is best known among heating and ventilating engineers as "Form No. 83":

Requirements of "Form No. 83," Inspection Department, Massachusetts District Police: In the ventilation of school buildings the many hundred examinations made by the inspectors of this department have shown that the following requirements can be easily complied with:

1. That the apparatus will, with proper management, heat all rooms, including the corridors, to 70 degrees F. in any weather.

2. That, with the rooms at 70 degrees and a difference of not less than 40 degrees between the temperature of the outside air and that of the air entering the room at the warm air inlet, the apparatus will supply at least 30 cubic feet of air per minute for each scholar accommodated in the room.

3. That such supply of air will so circulate in the rooms that no uncomfortable draught will be felt, and that the difference in temperature between any two points on the breathing plane in the occupied portion of the room will not exceed 3 degrees.

4. That vitiated air in amount equal to the supply from the inlets will be removed through the vent ducts.

5. That the sanitary appliances will be so ventilated that no odors therefrom will be perceived in any portion of the building.

To secure the approval of this department of plans showing methods or systems of heating and ventilation, the above requirements must be guaranteed in the specifications accompanying the plans.

NEW JERSEY'S VENTILATION LAW

Under the heading of "New Jersey's School Laws, Revision of 1903," is a section regulating the ventilation of schoolhouses. The act is known as the Stokes law, having been introduced by Governor Stokes of New Jersey, at the time when he was a member of the Legislature.

The ventilation requirements appear under Article X, Section 131, the first three paragraphs of which read as follows:

I. Light shall be admitted from the left or from the left and rear of classrooms, and the total light area must, unless strengthened by the use of reflecting lenses be equal to at least 20 per cent. of the floor space.

II. Schoolhouses shall have in each classroom at least 12 square feet of floor space and not less than 200 cubic feet of air space per pupil. All school buildings shall have an approved system of ventilation by means of which each classroom shall be supplied with fresh air at the rate of 30 cubic feet per minute for each pupil.

III. All ceilings shall be at least 12 feet in height.

NEW YORK STATE LAW.

This law was passed by the Legislature of New York in 1904:

An act to amend the consolidated school law, relative to proper sanitation, ventilation and protection from fire of schoolhouses.

1. No schoolhouse shall hereafter be erected in any city of the third class or in any incorporated village or school district of the State, and no addition to a school building in any such place shall hereafter be erected, the cost of which shall exceed five hundred dollars, until the plans and specifications for the same shall have been submitted to the commissioner of education and his approval endorsed thereon. Such plans and specifications shall show in detail the ventilation, heating and lighting of such buildings. Such commissioner of education shall not approve any plans for the erection of any school building or addition thereto unless the same shall provide at least fifteen square feet of floor space and two hundred cubic feet of air space for each pupil to

be accommodated in each study or recitation room therein, and no such plans shall be approved by him unless provision is made therein for assuring at least thirty cubic feet of pure air every minute per pupil, and the facilities for exhausting the foul or vitiated air therein shall be positive and independent of atmospheric changes. No tax voted by a district meeting or other competent authority in any such city, village or school district, exceeding the sum of five hundred dollars, shall be levied by the trustees until the commissioner of education shall certify that the plans and specifications for the same comply with the provisions of this act. All schoolhouses for which plans and detailed statements shall be filed and approved, as required by this act, shall have all halls, doors, stairways, seats, passageways and aisles and all lighting and heating appliances and apparatus arranged to facilitate egress in cases of fire or accident and to afford the requisite and proper accommodations for public protection in such cases. All exit doors shall open outwardly, and shall, if double doors be used, fasten with movable bolts operated simultaneously by one handle from the inner face of the door. No staircase shall be constructed with wider steps in lieu of platform, but shall be constructed with straight runs, changes in direction being made by platforms. No doors shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such doorway.

2. This act shall take effect immediately.

PENNSYLVANIA'S VENTILATION LAW.

Pennsylvania enacted a ventilation law in April, 1905, which was signed April 22 by Governor Pennypacker. Following is the text of the law:

Entitled an act for the purpose of governing the construction of public school buildings in order that the health, sight and comfort of all pupils may be protected.

Whereas, it is of great importance to the people of this commonwealth that public school buildings hereafter erected by any board of education, school trustees or school directors shall be properly heated, lighted and ventilated.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, that, in order that due care may be exercised in the heating, lighting and ventilating of public school buildings hereafter erected, no schoolhouse shall be erected by any board of education or

school district in this State, the cost of which shall exceed four thousand (\$4,000) dollars, until the plans and specifications for the same shall show in detail the proper heating, lighting and ventilating of such building.

Section 2. Light shall be admitted from the left or from the left and rear of classrooms, and the total light area must, unless strengthened by the use of reflecting lenses, equal at least twenty-five per centum of the floor space.

Section 3. Schoolhouses shall have in each classroom at least fifteen square feet of floor space and not less than two hundred cubic feet of air space per pupil, and shall provide for an approved system of heating and ventilation, by means of which each classroom shall be supplied with fresh air at the rate of not less than thirty cubic feet per minute for each pupil and warmed to maintain an average temperature of 70 degrees F. during the coldest weather.

Section 4. All acts or parts of acts inconsistent herewith are hereby repealed.

ORGANIZATION IN TORONTO.

The Master Plumbers' Section of the Toronto Employers' Association has partially completed its reorganization, having elected J. W. McKittrick as president and George H. Cooper, 113 Church Street, secretary. They expect to complete their organization at the next meeting on July 7.

There is also the recently organized association composed of firms who signed wage agreements with the union, with T. A. Norris, 26 Verral Avenue, secretary. This body is drafting a schedule of minimum prices to cover work done by plumbers and fitters and propose to affiliate with the national association and possibly with the Retail Merchants' Association also.

COMPULSORY SEWER CONNECTION

The city solicitors of Victoria, B.C., have advised the city council to enforce the by-law passed last year providing for compulsory sewer connection. When the city undertook to enforce this by-law shortly after its passage, several owners objected to complying with its terms and the city plumbing inspector took the position that the city could not compel them to comply. With this view the city solicitors disagree and acting on their advice the council will now take action to compel owners of property past which a sewer runs in the street to connect. There are several hundred cases affected by this opinion of the city solicitors and the work of notifying the owners that they must comply with the by-law will commence at once.

Some Common Boiler Troubles

A Writer in Building Management, Chicago, Outlines How Many of the Troubles Usually Met With Could Be Overcome.

Among boiler troubles, that of leaking tubes is, perhaps, the most common. As a rule, this is due to scale collecting around the tubes on the rear head and it is almost impossible to remove it from around the centre tubes, as they cannot be reached for efficient work with a scraper. The vertical spaces can, however, be cleaned fairly well by the persistent use of a long chisel-ended bar. A man should go inside and lie on the top of the tubes, facing the rear, and scrape the head.

Care must be used, if the bar is rather sharp, not to injure the tubes. If this is done and the tubes re-rolled and re-beaded, they can be made tight, and the rest of the scale will gradually work off if the vertical spaces are kept clean and a good scale solvent is used. If the head is heavily coated with scale, there is little use in trying to keep the tubes tight after they once begin to leak, especially if the boiler is forced at all. A great many tubes are put in without beading over the rear ends. This is a mistake, as the flames striking these thin ends, soon burn them, making them brittle and destroying their holding power.

Cracks at Rivet Holes.

Another common trouble is with what are known as "firecracks." These are cracks extending from the rivet holes to the edge of the plate, and they usually appear at the front girth seam, where the heat is most intense. If they do not leak or extend back into the body of the sheet, they are of little consequence and the best thing to do is to let them alone. They are almost invariably caused by the use of the drift pin in building the boiler.

When the sheets are rolled up and put together for riveting the holes do not always come "fair," that is, they do not come directly over each other, and the rivet cannot be inserted. Instead of reaming these holes out, as he should do in such a case, the boilermaker drives a taper drift pin in and springs, or rather stretches, the sheets until the rivet can be put in. As a matter of course, the steel at this point is stretched beyond its elastic limit, and the constant contraction and expansion while in service is almost certain to develop a crack. If these cracks leak, the best thing to do is to cut the rivet out at once, ream the hole out perfectly fair, and, in bad cases, countersink it. Then drive a new and larger rivet.

Blowoff Pipes.

Another troublesome feature about the boiler plant is the blowoff pipes. These

necessarily pass through the combustion chamber and are subjected to intense heat. When the boiler is fed by an independent pipe, there is no circulation in these blowoff pipes and they are apt to become heavily scaled and bulge or burn off unless protected by some form of covering. Perhaps the most common form of such covering is a sleeve of larger pipe. This, however, is of little value, as generally it is too small. It is also difficult to keep in position, usually lying against the blowoff, where it is worthless.

At the best, the pipe soon burns off and it is then necessary to disconnect the blowoff, in order to renew it. If a sleeve of this kind is desired, use a piece of 6-inch cast iron pipe, as it will last a great deal longer than wrought iron. The best method is to run the blowoff straight down to a point near the floor and build a brick pier around it. This can be repaired easily, when necessary, at practically no expense, without disturbing the blowoff, and will be found serviceable. Under no circumstances use cast iron fittings inside the combustion chamber. Cast steel is the proper material for this purpose and if it cannot be obtained, use malleable iron.

Care and Inspection of Plant.

Know every detail of your plant from the ash bin to the throttle, from personal inspection. Don't be afraid to go inside a boiler and look for broken braces, scale in remote corners, choked blowoff pipes and water column connections, and many other fruitful causes of trouble. Go in the fire doors of the furnace and come out at the rear cleaning door. Don't allow a pile of loose bricks, scrap iron and soot on top of the boiler and see that the safety valves are tight and free to operate at the proper pressure. See that the feed pumps are kept clean and tight and the engine and engine room clean. Don't try to keep the engines keyed up too tight. A knock is annoying, but remember that a hot bearing is worse. When a brass is loose key it up gradually, and when you have to listen intently for a knock, don't try to get rid of it. It depends largely upon the individuality of an engine how tight you can run it.

When you can afford it, get an indicator and use it. Get a good one, but not a fine one, for everyday use knocking about an engine room. Good indicators can be bought at a small cost. Don't lie awake at night worrying about a peculiar wave in the expansion curves while several tubes in one of the boil-

ers are leaking or a flange in the steam line is leaking badly. If you have time, make the diagram as nearly perfect as possible by all means. But remember that a slight leak in the boiler or heater is more wasteful than some fine point in the indicator diagram.

BOILER SCALE PREVENTION.

It is seldom that information regarding the cause and formation of boiler scale, its effects and the best means of its prevention are more clearly presented than in the following extract from a report rendered some time since by Arthur D. Little, chemist, of Boston, to one of his clients, as reproduced in a recent issue of Building Management.

"All water, especially surface waters contains more or less mineral matter in solution which remains in the boiler as an encrustation when the water is boiled away or converted into steam. The mineral ingredients most commonly found in water and which cause the formation of boiler scale are the salts of calcium and magnesium. When the water is converted into steam these substances gradually separate out from the solution in the form of deposits and coat the inner surface of the boiler with scale.

"Scale formation is detrimental in several ways. It is a non-conductor of heat and the fires must therefore be driven harder to accomplish the same results. The water becomes separated from the boiler plates and these latter become overheated and are gradually burned out. The tubes and feedpipes of the boiler become more or less clogged and consequently become less efficient. Some of the scale-forming ingredients, especially magnesium chloride, also exert a corrosive action upon the iron.

"The aim of a boiler compound is to convert these substances into insoluble compounds which settle in the form of sludge or mud and can be removed from the boiler by blowing or washing.

"We could prepare a list of nearly two hundred materials which are known to have been used for boiler cleaning purposes, but there are only four of these which are worthy of mention. They are:

"Soda ash, or sodium carbonate.

"Caustic soda.

"Tannin.

"Kerosene.

"Soda ash is an alkali and will neutralize any acid in the water, and also precipitate salts of lime, magnesia, iron, and alumina, in the form of soft sludge which can be easily removed when the boiler is cleaned.

"Caustic soda is also an alkali and neutralizes acids and aids in the pre-

precipitation of the various salts.

"Kerosene is used in connection with the above to prevent foaming or priming.

"Tannin is also used to prevent foaming or priming, and will precipitate certain mineral matters, although it is not so efficient in this respect as soda ash or caustic soda."

SEWERAGE SYSTEMS CENTURIES AGO.

It is generally supposed that it is only modern man who has perfected a system of drainage and sewerage to carry from his house and city the overflowing rain water and filth and garbage which accumulate.

In the excavation of Bismya, the ancient Sumerian or pre-Babylonian city, which flourished 4,500 years ago, a remarkable system of drainage, perfectly adapted to the alluvial plain of the potamian desert, has been discovered.

Babylonia is perfectly level. From Bagdad to the Persian gulf there is not the slightest elevation, save for the artificial mounds or an occasional changing sand drift.

Sun Baked Clay.

In most places there is a crust of hard clay upon the surface, baked by the hot sun of summer time, so hard that it resembles stone. Parts of the desert are perfect for bicycle riding.

Beneath the crust, which at Bismya is seldom more than four feet in thickness, and in places entirely lacking, is loose, caving sand reaching to an unknown depth. Drainage in such a country, without sloping hills or streams of running water, might tax the ingenuity of the modern builder.

In constructing a house the ancient Sumerian of more than 6,000 years ago first dug a hole into the sand to a considerable depth; at Bismya several instances were found where the shaft had reached a depth of 14 meters beneath the foundation of the house.

From the bottom he built up a vertical drain of large, cylindrical terra cotta sections, each of which is provided with grooved flanges to receive the one above. The sections of one drain were 19 inches in diameter and six in height; the thickness of the wall was about an inch.

Tiles Were Punctured.

The tiles were punctured at intervals with small holes. The section at the top of the drain was semispherical, fitting over it like a cap and provided with an opening to receive the water from above. Sand and potsherds were then filled in about the drain, and it was ready for use.

The water pouring into it was rapidly absorbed by the sand at the bottom, and if there it became clogged the water escaped through the holes in the sides of the tiles.

The temple at Bismya was provided with several such drains. One palace was discovered with four; a large bath, resembling a modern Turkish bath and provided with a bitumen floor, sloping to one corner, emptied its waste water into one.

In clearing out the drains at the temple we removed dozens of shallow terra cotta drinking cups, not unlike a large saucer in shape and size. Evidently it received the waste water of a drinking fountain, and the cups had accidentally dropped within.

Shaped Like Modern.

In the Bismya temple platform, constructed about 2,750 B.C., we uncovered a horizontal drain of tiles, each of which was about a yard long, and not unlike in shape those at present employed. It conducted the rain water from the platform to one of the vertical drains.

The Babylonians of a later period, who buried instead of cremating their dead, carefully provided their cemeteries with drains. The graves were small, house-shaped structures entirely, or partly above ground, and whenever they were found upon the sloping side of a mound they were protected above by a breakwater, while along the sides were square, open, brick drains.

The result was that some of the graves, although thousands of years old, and constructed of unbaked clay, are still in a perfect state of preservation.

DISPOSAL OF TOWN REFUSE.

Several short papers on the disposal of refuse in American cities were recently communicated by different authors to the New York section of the Society of Chemical Industry, and the papers have been published in the current issue of the journal of that society. Hitherto dumping of the refuse on low-lying meadow land has been the method of disposal most commonly adopted in American towns, although garbage furnaces have been used there to a certain extent for more than twenty years and Rudolph Hering states that there is no city in the United States where all the city refuse is mixed and properly incinerated. Referring to the removal of garbage from hotels and restaurants in New York, Mr. Morse says that the quantity of garbage taken away by private agency amounts to from 15,000 to 20,000 tons per annum, but that the best hotels are now recognizing the advantage of a garbage destructor. At the

new Hotel Astor a destructor equipped with a boiler for low-pressure steam is about to be installed. Some interesting information concerning the work of the New York Department of Street Cleaning is contained in the paper communicated by Edward D. Very. He says that the wastes of New York City are on the average proportioned as follows: Household ash, 47.5 per cent.; steam ash, 18 per cent.; street sweepings, 18.5 per cent.; rubbish, 6 per cent.; garbage, 10 per cent. The garbage received at the reduction plant in Jamaica Bay contains 71 per cent. water, 6 per cent. rubbish, 20 per cent. tankage, and 3 per cent. grease. The grease is extracted by digesting the garbage with steam and then passing the garbage pulp through hydraulic presses to express the grease and water. The grease is of a low grade and has a dark brown color. The greater portion is exported and is used for making soap and candles. Tankage is the solid fibrous matter remaining in the presses, and is used as a fertilizer base or filler. It appears probable that in the largest American towns the European practice of incinerating the refuse in destructors erected within the towns will be generally adopted in the immediate future.

FORGOT TO TAP THE TRAP.

A well-known New Jersey master plumber was called upon to clean out a sink pipe. After several unsuccessful attempts to force out the stoppage, a wire was used. It was pushed down through the connection lift in the back air pipe leading from the trap which was a full S. After several attempts it was found that the wire would not go beyond the joint. The pipe was cut above the wiped joint on the trap, and here it was found that the trap had not been tapped, but a lead pipe had been wiped on by some forgetful plumber who left the trap closed putting in a useless vent pipe. It had been used for eight years in this manner.

Tenders have been called for on three very large undertakings at Calgary. The waterworks committee of the city council have advertised for tenders for supply and construction of wooden stave pipe for the gravity system, about ten miles in length. This includes steel rods, tongues and valves. Each item may be tendered for separately. Tenders close July 3. Construction on this huge undertaking may be expected to begin during July. Calgary's gravity system is the largest municipal enterprise ever undertaken between Winnipeg and Vancouver.

Maximum Economy and Circulation in Heating

It is acknowledged by those of experience that the most satisfactory results in circulating steam of low pressure in a heating system, are secured by means of the vacuum principle. The economy, however, of such a system depends entirely on the automatic vacuum valve used, all of which up to the present time, waste more or less steam by blowing through into the return line, although the construction of some has reduced this waste more than others.

As the other details and plans on which such systems operate, are the same with all the different vacuum systems, it is readily seen how the economy or waste of the vacuum valve influences the economy or waste of each particular system.

The Simonds Heating & Specialty Co. of Detroit have perfected the Automatic Vacuum Valve until their Simonds valve is claimed to overcome all of the objections of the other valves on the market, including the blow through or wasteful feature above mentioned. As a result this valve possesses the following advantages:

Advantages of Automatic Valve.

Will not blow steam through and waste it while discharging the air from the system.

Valve is tight on its seats when not discharging water.

Is perfectly balanced, therefore will operate equally well with any ordinary steam pressure or any degree of vacuum.

Has large discharge openings that overcome the fouling with foreign matter, so common with other valves, the smallest size having $\frac{1}{2}$ -in. free discharge.

Discharges the air from top of float chamber and water from lowest point.

Is operated by a float, so that a free discharge is promptly secured according to the amount of water to be taken care of and without any cooling effect on the radiation, as necessary when a change in temperature is required to open discharge.

Is so constructed that when cold there is a vent through the valve to allow of expelling the air from the system before water comes sufficient to raise the valve.

The installing of these valves on the ordinary vacuum system will, on account of their economy of steam, secure results not approached by any other standard system.

But together with this advantage the same company also have improved on the ordinary vacuum system until they now have in their compound vacuum system, an economy as well as advantages that they claim cannot be equal-

led in any other steam heating system in the world.

Compound Vacuum System.

This system is all that the name implies, and secures results in comparison with the simple or standard vacuum system, approaching the comparative economy of the compound over the simple engine.

In this system, the radiation is divided into primary and secondary sections, the primary being similar to the standard steam radiation and is supplied with steam from the steam mains and has the automatic vacuum valve in its discharge or return. This discharge, instead of being directly into the main return, is into a secondary section of radiation or secondary radiation, which being under the same vacuum as the main return, causes the hot water of condensation in part when discharged into the lower pressure of this secondary to re-evaporate and fill this section with its vapor, which will be again condensed and pass from it as solid water, to the vacuum pump.

The secondary section has no valves whatever.

As a result of this compounding principle, the units of heat in the steam are all utilized in effective radiation and are given off in the rooms to be heated instead of having to destroy the units of heat in the hot water discharged from vacuum valve (and which will vaporize in the vacuum return line, and destroy the vacuum unless condensed) by a jet of cold water at the vacuum pump in order to continue the vacuum, and which is necessary in other vacuum systems. By this plan, it is destroyed by the secondary section of radiation, which acts as a surface condenser and its heat units are utilized in warming the rooms, instead of being wasted by the cold water jet where it does no good, and necessitates the waste of water also.

Compounding can be done in many ways, either from one radiator to another or from two or more into one, or in one compound radiator in one unit which this company has also brought out to meet this requirement.

The advantages of this compound system are equal in every way to the advantage of the simple or standard vacuum system, and it also has the following advantages not possessed by the simple system.

Special Advantages Claimed.

Economy in steam used for heating, consequently in fuel economy.

Owing to only part of the entire radiation being supplied with steam from the mains, such mains, risers and

connections can be much smaller. Radiator connections are $\frac{1}{2}$ in. for 90 and $\frac{3}{4}$ in. for 150, and 1 in. for 300 square feet.

By reducing the vacuum in the return line to a point that will not cause the condensation to vaporize in secondary radiation that radiation does not heat, thus cutting out, by this one adjustment of vacuum pump, from 25 per cent. to 35 per cent. of the radiation in each room, resulting in a moderate amount of heat for moderate weather.

If a further reduction in heat is desired the vacuum in the return line can be carried at the normal point and the pressure in steam line cut down to four or five inches of vacuum when the secondary will not heat, although the primary is entirely warm it has only a temperature corresponding to the four or five inches of vacuum or about 202 degrees.

There is no snapping or pounding in the system and the circulation is perfect, even at the most remote points.

The Simonds company have installed nearly fifty of these systems and 2,000 valves in operation.

THE WEBSTER HUMIDIFIER.

Something new is being placed on the Canadian market in the Webster Air Washer and Humidifier that is used in



Webster Air Washer and Humidifier.

connection with the Webster system of steam circulation for heating purposes, for which Darling Bros., Montreal, are the agents. It consists principally of a spray chamber and an eliminator made of galvanized iron or copper. The air to be washed, humidified or cooled, passes first into the air chamber where it is thoroughly washed and cleansed by passing, as may be desired, through

from two to four sheets of water, having a combination "rain-and-spray" effect.

These effects are produced by special patented copper spray heads, and it is found that these remove dust and dirt from the air and have a great cooling effect. After leaving the spray chamber the air passes through the eliminator, where all the entrained water or unevaporated moisture is removed, thence through the ventilating system into the building.

The special feature of the Webster eliminator is the use of horizontal baffle plates and any entrained water is carried off at once horizontally to a gutter and returned to the water tank, thus preventing re-contact with the lower strata of air passing through the eliminator. A water tank which may be

dies to start without any hand pressure or extra exertion, and through its employment the thread-cutting that a tool is capable of doing is not limited simply to threads of the same pitch, or number to the inch, or to one direction of lead, but it can be made possible to thread either right or left-handed. To change, the leader ring is released from engagement by removing a screw, the dies then being started by the pressure of the hand. There is no reversing of the dies to be done in connection with this device, nor screw-apart of pieces after a thread has been finished; neither is there the wear to contend with that there is with a leader screw, such wear being second only to that on the cutting edges of the dies. The illustrations give two views of this leading device, one showing the device itself; the other

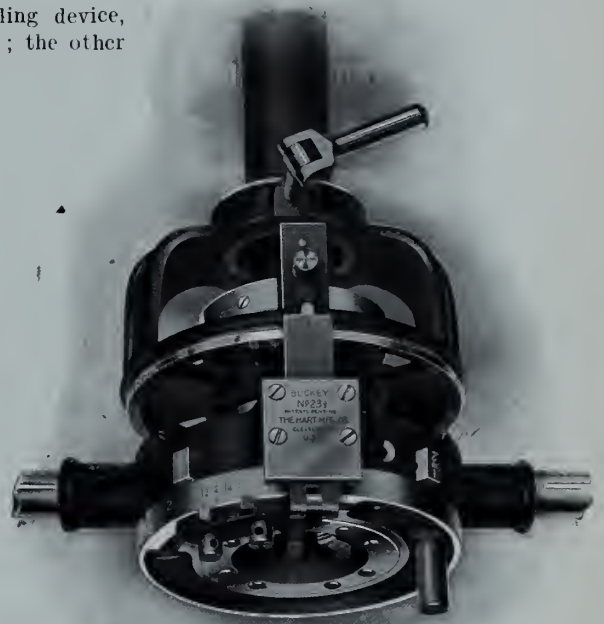
COPPER FOR STEAM PIPES.

In a recent lecture before the Institute of Marine Engineers of London, J. T. Milton, chief engineer of Lloyd's Register, made an interesting declaration on the use of copper for steam pipes. Speaking on this point, he said:

"Copper is valuable for steam pipes chiefly on account of its ductility, its ability to withstand considerable repetitions of changes of form, and its non-liability to rust. Ordinary copper contains a proportion of impurities such as arsenic, bismuth, antimony, lead and other metals, but by electrical deposi-



Leading Device of Hart Pipe Die Stock.



View from above when on a Piece of Pipe and Ready to do the Threading.

made of concrete, galvanized sheet iron or copper, contains the spray water which is circulated by hydrostatic pressure by means of a centrifugal pump. The illustration is a view showing the spray chamber and eliminator.

HART PIPE DIE STOCK.

The Hart Mfg. Co., Cleveland, Ohio, makers of "Buckeye" tools for threading pipe, have issued a special catalogue descriptive of their die stocks. One of these tools, the "Die Leading Device," for which patents are pending, has several features which are quite distinctive. Instead of a leader screw ordinarily used with the narrow, expanding style of dies, a leader ring has been adopted, which automatically causes the

viewed from above on a piece of pipe ready to do the threading.

CANADIAN GAS ASSOCIATION.

The first annual meeting of the Canadian Gas Association was held at the King Edward Hotel, Toronto, Canada, on Friday and Saturday, June 26 and 27, representatives being present from most of the gas companies in Canada.

The following papers have been prepared: "Producer Gas Fired Benches," W. H. Pearson, Jr., Toronto; "Coal Tar and Ammonia," J. Keillor, Hamilton; "Gas Appliances," C. Forbes, Ottawa; "Commercial Side of the Industry," L. S. Bigelow, Willimantic, Conn.; "Producer Gas for Power Purposes," E. J. Philip, Berlin; "Experiences With Canadian Coal," R. A. Wallace, Quebec.

tion it is possible to obtain pure copper. The latter is especially useful for electrical purposes by reason of its high conductivity. Impurities affect the conductivity to a great extent. The presence of bismuth in copper is exceedingly deleterious, one part in 1,000 rendering the copper useless for important works, as at high temperatures its strength is reduced, and the copper becomes very brittle. Impurities in copper, when in small quantities, on the whole have a good effect for most purposes, and the recent British admiralty tests allowed 0.7 per cent. for these. In making sheet copper it is cast in slabs and first rolled when hot. Subsequent thicknesses are rolled cold, and the quality of the copper depends to a great extent on the amount of work put upon it in undergoing this process."

NEWS OF THE TRADE IN CANADA

J. E. Farrell, North Bay, recently paid a visit to New York city.

Joannette & Mathieu, plumbers, Montreal, have been registered.

The Canadian Buffalo Forge Co. have opened an office at 17 Bleury St., Montreal.

Hubert Lefrancois, plumber, Ahuntsic, Que., has filed a consent of assignment.

A. E. Cottrell, plumber and tin-smith, Toronto, is advertising his business for sale.

The Labatt Mfg. Co., plumbing supplies, are removing the head office of the concern from London to Toronto.

J. H. Hedley, a Markdale, Ont., plumber, has bought the hardware business of Foster & Hamilton, Clarksburg, Ont.

The Berlin, Ont. District Steam Heating Co. is in liquidation. The assets are about \$99,000 as against \$60,300 liabilities.

Mr. Woods, manager of the Labatt Manufacturing Company, Toronto, is spending his holiday at his old home at Kingston.

M. J. Barr, Vancouver, and Tom Cotter, Winnipeg, two of the best known plumbers in Western Canada, visited Toronto recently.

A. G. Phinney, Halifax, is installing 300 feet of galvanized iron pipe in the new wool-blowing machine in the Stanfield mills at Truro, N.S.

Wm. B. Geary, Belleville, has taken charge of the plumbing and heating department of John May's new hardware store. For years Mr. Geary was with the John Lewis Co.

The Jenkins Valve Co., Montreal, is now in running order. W. R. Stavert, for many years Canadian representative of the Boston firm, will in future be connected with the Montreal company.

J. T. Norton, plumber, who some three years ago succeeded P. H. Forman in the hardware business in Ingersoll, Ont., has assigned. The stock has been sold to Mr. Forman, who is again in charge of the store.

Somerville, Limited, Toronto, are now handling "Viking" and "Daisy" boilers, and "King" radiators; and a display of these goods is being made in their showrooms. Travelers for the company are now accepting orders for radiation.

Norman Comper, a young plumber employed by Taylor & Hamilton, Kingston, had a very narrow escape from being suffocated by gas on Friday while

engaged in making some connections with gas pipes at a residence on Wellington Street.

The Montreal Water Committee has awarded contracts to James Robertson for the supply of tin at 29c. lb., lead piping at \$83 a ton; special castings to P. Amesse at \$49.50 a ton, and to W. R. Cuthbert brass castings at 16½c and bronze at 19½c lb.

A system of cold air drafts, as well as means of removing the dust is being put in the McClary plant at London, Ont. Hot and cold water baths in the foundry, and a private water cart are also to be used to keep the premises as cool as possible.

Jos. Watt & Sons, plumbers, Chatham, Ont., have been awarded contracts for heating, plumbing and water conveniences in the Arlington Hotel, Montreal House, Stonehouse Bros.' store and T. B. Dundas' residence, all in Wallaceburg, Ont.

Paul Smith, Canadian representative of the Ideal Manufacturing Company, Windsor and Detroit, had a display of gas ranges and heaters at the Toronto Furnace Co.'s warerooms during the Canadian Gas Association's convention at Toronto June 26 and 27.

Two more master plumbers have been added to the Chatham, Ont., plumbing fraternity. They are A. E. Jones, of the Chatham Electrical & Machine Co., formerly associated with McKeough & Trotter, Limited, and Ed. Mackness, until recently a member of the staff of Westman Bros.

Amongst the visitors in Toronto last week was Mr. Adolph Mueller, president of the H. Mueller Manufacturing Company, Decatur, Ill. Mr. Mueller expressed himself as greatly pleased with the outlook for business in Canada, his company having a wide connection with the trade requiring high-grade brass goods.

The plumbers employed by Simmons Bros., Kingston, went out on strike on Monday morning. The cause of the strike was that a union man who was behind in his dues was taken on. The union demanded his discharge but this was refused, so the men walked out. It is the intention of the firm to run an open shop in future.

The contract for 161 tons of six-inch, 50 tons of four-inch cast iron water service pipe, and two tons of specials for Edmonton, was awarded to Gorman, Clancey & Grindley, who offered to supply the six-inch and four-inch pipe at \$47.50 per ton and the specials at \$72 per ton. The pipe to be supplied will be manufactured by Gartshore, Thompson & Co., of Hamilton.

Contracts have been let for three school buildings in Fort William, Ont., one of them being a four-roomed addition to the Ogden School, and the other two being eight and four-roomed respectively. In all of these buildings the plumbing and heating contracts were secured by the Superior Heating & Plumbing Co., a firm which was formed this spring by Culliton & McRae.

In the suit of E. J. Lennox to recover the amount of his bill for services rendered in connection with the construction of the city hall, Toronto, Master-in-Chambers Cartwright reserved judgment on an application on behalf of the city for an order directing S. S. Clarke, formerly accountant with Bennett & Wright, to produce before the examiner at Calgary all the books, ledgers, cheques, etc., which were produced at the investigation before Judge Winchester in 1905.

N. D. Tillman, of the Honeywell Specialty Co., reports business good in Montreal, and has equipped many of the large residences in that city with the Honeywell system of hot-water heating.

A new plumbing and heating firm recently located at Fort Frances, Ont., is Partridge & Anguish, who are desirous of receiving catalogues and price lists from manufacturers and supply houses. Both members of the firm are experienced plumbing and heating men, Mr. Partridge having been connected with T. L. Partridge, in London, and Mr. Anguish a member of Anguish & Whitfield, Brantford.

Years ago F. Parlee, a steamfitter employed in the C.N.R. shops at Edmonton, bought 50 shares of Union Oil stock at 20 cents per share and almost forgot about it. The share certificates were left in the bottom of an old trunk, and were regarded simply as a reminder of a bad investment. A few days ago, however, Parlee happened to be in a broker's office in Edmonton and mentioned the fact of his having these shares casually. The broker thereupon informed him that the stock was worth \$224 per share, together with the accrued dividends, which Parlee had never claimed. This meant a tidy fortune of about \$12,000 for him. He has gone to California to claim it.

HANGING WATER MAINS

A plan for a hanging high-pressure water system for fighting fires in Chicago has been presented to the fire chief of that city and approved. The idea is to hang the pipes under the tracks of the Union elevated loop and, by making a connection with the fire boats in the Chicago river, force water through them at the rate of 100,000 gal. per minute.

UNIQUE WINDOW DISPLAY.

The accompanying illustration depicts an unusual window display of regular stock articles handled by the McKeel-Richardson Hardware Company, Washington, North Carolina. The design and dressing were done by A. D. Tanfield, an employe of the company. Perhaps the most striking features of this elaborate bit of work are the two workmen, made entirely of fittings, their hair being of spun oakum. One is at work at a vise, and the other is busy with a valve.

Hartman Bros., Midland, have a rack of pipe and fittings, on which valves are effectively displayed. If there are any

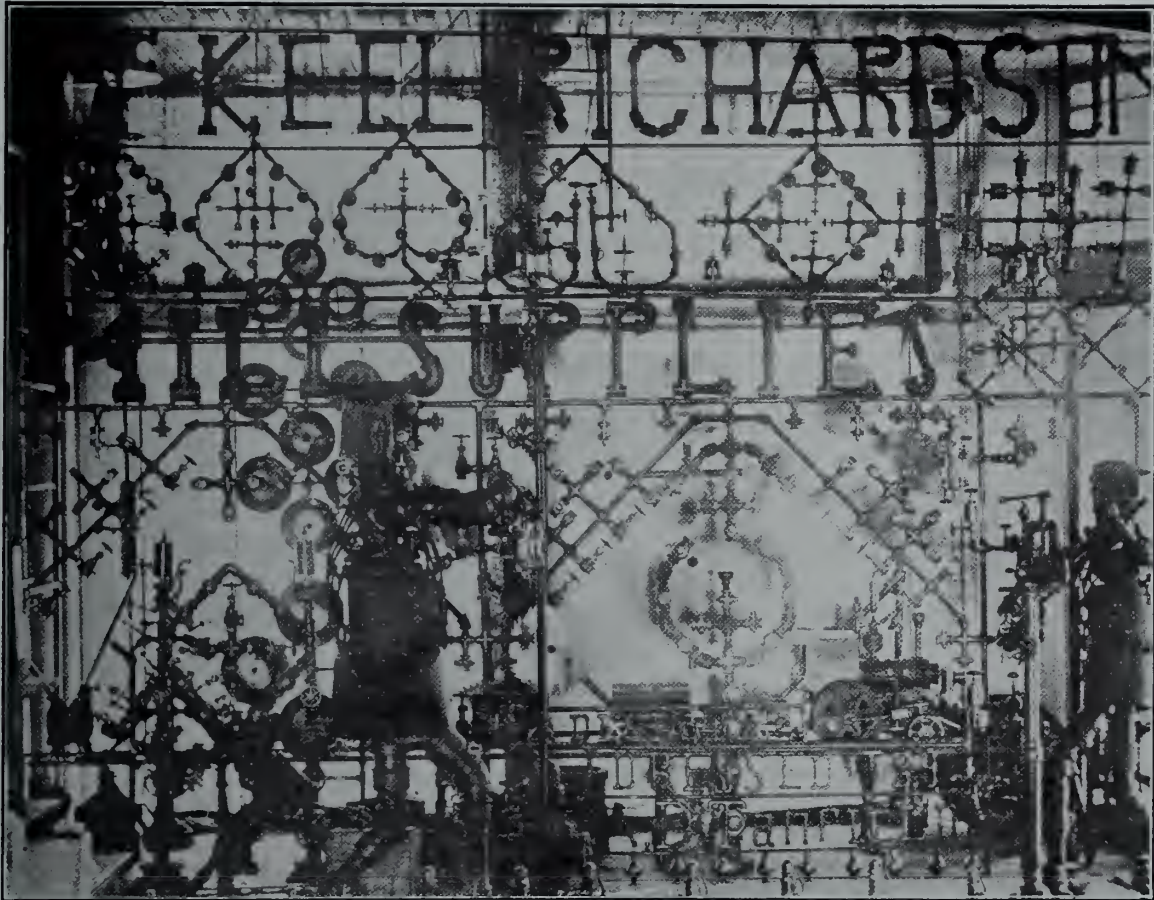
denser form of oxygen, one molecule of the gas containing three atoms, whereas one molecule of oxygen contains only two atoms. Air charged with ozone has an irritating effect on the respiratory organs. The gas may be prepared experimentally by passing an electric current through pure dry oxygen. Little is known of the circumstances under which it is produced in nature. It is, however, intimately related with the development of atmospheric electricity.

Although gases are of different densities, they have the power, when brought in contact, of intimately mixing together. This important property is termed the diffusion of gases, and has an important bearing upon the air of buildings, which is kept pure to a large

perature than that of the surrounding air quickly diffuse and become diluted, but in crowded buildings, and even in dense crowds in the open air, the impurities are often produced at a greater speed than the rate of diffusion.

WATER PURIFICATION.

J. Howard Bridge, Philadelphia, an expert in the methods and modes of treating water supplies for purification purposes, proposes installing a demonstration plant in Toronto. He visited Lindsay, Ont., a short while ago, and before a number of prominent citizens of that place, explained the "ozonizing" treatment. Briefly, it is the forcing of ozone into the water by a suction process, the ozone thus added purifying it



Unique Window Display of Pipe, Fittings and Valves, Made by a North Carolina Hardware Store.

other Canadian steamfitters who have put together similar ingenious displays we would like to receive photos for illustration in these columns.

GASES IN THE AIR.

Ozone is a colorless gas of peculiarly unpleasant odor. Outside of the laboratory it is found only in open country and sea air. It is chiefly remarkable, said N. W. Hoskins before Royal Sanitary Institute, London, on account of its oxidizing power, and plays an important part in removing organic impurities from the air. Ozone is really a con-

extent by diffusion. Gases diffuse in the inverse ratio of the square root of their densities. The lighter the gas, the more quickly does it diffuse. Diffusion of gases takes place also, to a less extent, without being in actual contact.

The materials used for constructing the walls of buildings permit the air to pass through more or less rapidly to diffuse with the outer air. The spontaneous mixing of gases is caused by their particles being always in rapid motion. A very small quantity of coal gas is soon detected in a building, owing to the power of diffusion. Gaseous impurities which leave our bodies at a higher tem-

perature; all noxious germs are destroyed and injurious vegetable or animal matter is turned into harmless carbon. The system is not claimed to be new, but the excessive cost in the past was against its general adoption. Now this has been changed (by new inventions) and a plant for a town the size of Lindsay could be established for about \$5,000.

The Borden-Canadian Company, Toronto, have entered into the second year in the manufacture of the well-known line of "Beaver" pipe threading tools. They are looking forward to a much larger trade this coming year.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

A courthouse will be built at Arcola, Sask.

A \$30,000 school will be built in Regina, Sask.

A new public school will be erected at Nokomis, Sask.

A \$25,000 post office will be built at Humboldt, Sask.

A \$15,000 school will be erected in Whitewood, Sask.

A Home for Consumptives will be erected in Ottawa.

A new \$12,000 Separate school will be erected in Hamilton.

Lansdowne, Man., purposes erecting a \$2,000 school house.

Five new schools will be built by the Winnipeg school board.

A Roman Catholic hospital will be erected in Daysland, Alta.

West Toronto will spend \$5,000 on the building of a new fire hall.

It is stated that a new High school will be erected at Golden, B.C.

L. Hanson, Sunburg, B.C., will erect the new school at Glenmore, B.C.

A four-room addition will be made to the public school at Lakefield, Sask.

A Divinity College will be erected in Prince Albert by the Anglican church.

St. Thomas' church, Toronto, will build a parish house to cost \$13,000.

The Seventh Day Adventists, London, will erect a large church in that town.

Parkdale Methodists will erect a \$40,000 edifice in that section of Toronto.

The Salvation Army will this summer erect a maternity hospital in Calgary.

Tenders have just been taken for the erection of a school at Weyburn, Sask.

Presbyterians will build a new church at New Edinburgh, near Chatham, Ont.

The erection of a \$40,000 post office at Grand Forks, B.C., is being considered.

The Nelson, B.C., school board are to erect a new school building to cost \$60,000.

Carl Bertch has decided to erect a theatre building at Edmonton at a cost of \$90,000.

The North Toronto school board is considering the erection of a new school building.

The ratepayers of Gilbert Plains, Man. will vote on a by-law to spend \$15,000 for school improvements.

Murphy & Martin, Regina, have the contract for the building of the Gratton school, in that city.

Hespeler, Ont., Presbyterians will erect a new church this summer at a cost of about \$20,000.

The corner stone of a second Catholic church, to cost \$60,000, was laid on June 14, in Peterboro.

Four of Toronto's public schools will be enlarged during the summer vacation at a cost of about \$75,000.

Oak Bay, (B.C.) Council has passed a by-law to raise \$10,000 for the purpose of building a new school.

Woodward Bros., Calgary, have the contract for the new \$100,000 hospital to be erected in that city.

Chas. Gillespie, Parry Sound, was the successful tenderer for the new school; approximate figure \$16,000.

Owen Sound has passed a by-law for \$11,000, to be spent on additions to be made to Boyd Street school.

The plans of Mr. Barnett, architect, have been adopted for the new Roman Catholic church at Vernon, B.C.

The contract for a four-room addition to Alexandra School has been let to F. H. Webb. The price is \$18,488.

The London Public School Board have decided to install a new steam heating plant in the Chesley Avenue school.

Robt. Ireland, architect, has completed plans for the St. John Anglican church and rectory, Fielding, Sask.

Plans are being prepared for a new Catholic convent, to cost \$65,000, which is proposed to be built at Brandon.

A new Presbyterian church is in the course of erection at Asquith, Sask. The building will cost about \$2,500.

St. Catharines city council has approved of the public school board's request to build a new \$10,000 school.

Yarmouth, N.S., school trustees have decided to rebuild the Paddon's School on Yarmouth Heights at a cost of \$5,000.

Tenders will shortly be taken by the Separate school board for the erection of a four-roomed brick building at Calgary.

The McCartney Fowler Co., of Regina, were awarded the contract to build the new Francis, Sask., public school at \$10,280.

Longueuil, Que., is asking for tenders for rebuilding the market and town hall which is expected to cost from \$12,000 to \$15,000.

The congregation of the Presbyterian church at Hespeler, Ont., will erect a new building this summer at a cost of about \$20,000.

Tenders will be received up to June 30th for the installation of a steam heating plant in the Centre school, Vermilion, Alta.

Tenders will be received by the chairman of the Minnedosa, Man., school board for the erection of a school building in that town.

The city clerk of Saskatoon, Sask., wants tenders up to July 3 for plumbing, heating and electrical work of the hospital building.

Snyder Bros., Portage la Prairie, have been awarded the contract for the erection of the training school, the contract price being \$67,000.

The Preston, Ont., School Board have awarded the contract for the addition to the public school to Frank Fach. The tinning, plumbing and heating are yet to be let.

The Separate School Board will erect a school in the extreme east end of Hamilton, at an estimated cost of \$12,000. The building will be of cement, and will have four rooms.

Storey & Von Symonds' plans have been accepted for the new Collegiate Institute at Regina, Sask. This will be one of the finest school buildings in the west, and will cost about \$150,000.

The estimates for the new Dominion Government public building at Dauphin, Man., have been passed and the Government is now in a position to proceed with the new post office. Estimated cost \$36,000.

The Chatham Public School Board are advertising for tenders for steam heating the Central school and the Collegiate Institute. The former has hitherto been heated by the Chatham Steam Heating Company at a flat rate of \$1,000 per annum; but the company has declined to renew the contract except at meter rates. The board accordingly purpose doing their own heating.

General Building Notes.

A \$100,000 Y.M.C.A. building is proposed to be built in Halifax.

A new five-storey apartment house is likely to be built in Victoria.

C. P. Walker, of the Walker theatre, Winnipeg, will erect a new hotel.

The Canadian Pacific Railway will erect a new station at Dryden, Ont.

The Bank of New Brunswick are erecting a new branch at Carleton, N.B.

The Joint Stock Apartment Company will erect a five-storey block in Winnipeg.

Over 30 buildings were burned in the fire which swept Burk's Falls, Ont., on June 20.

V. W. Horwood has plans for a \$60,000 apartment block, to be erected at Winnipeg.

The Northern Bank contemplate erecting a new business block in Red Deer, Alta., next year.

McMahan, Granger & Co., London, will build a new \$35,000 fireproof wholesale dry goods warehouse.

J. Murray is stated to be planning the erection of a five-storey steel and concrete block at Fort William.

H. C. Wilson & Sons, music dealers, Sherbrooke, intend erecting a three-storey warehouse next spring.

Toronto's building permits to June 20 call for the erection of 210 new houses at an expenditure of \$651,100.

C. S. Bridgman, Winnipeg, has about completed plans for a church, a warehouse and apartment block in that city.

A \$15,000 clubhouse for the Parkdale Club will be erected on Queen Street West, Toronto.

The Metropolitan Bank will erect a branch bank at Danforth and Broadview Avenues, Toronto.

A two-storey addition will be erected to the Inns of Court building, Vancouver, at a cost of about \$30,000.

Love Bros. and G. A. Weismiller will erect blocks of houses in Toronto, valued at \$18,000 and \$14,000 respectively.

E. J. Roehon, of the Leland hotel, Winnipeg, is stated to be contemplating the erection of a large block at Fort William.

The McCartney Fowler Co., Regina, has the contract for the public school at Francis, Sask., their figure being \$10,280.

The Walper hotel property, Berlin, has been purchased by William Roos, who will make extensive improvements at a cost of some \$10,000.

Port Arthur city council have decided to submit a by-law to raise \$175,000 for the erection of a new municipal building to include the opera house.

Toronto's building permits for the first five months of this year total \$3,957,840, but half the total of those issued during the same months last year.

The following school buildings are being erected: Wolfville, N.S., college; Preston, Owen Sound, Paris and Parry Sound, high schools, and Brockville, separate school.

Andrew McFarland, clothier, has purchased the old opera house property in Brantford, for \$10,000, and will erect a new store. The theatre was recently destroyed by fire.

The contract for seven new residences at R. N. W. M. P. Barracks, Regina, has been awarded to McGregor & Black, and work will be started at once. These

houses are to be used for officers' quarters, and will be thoroughly modern.

At a meeting of the Calgary, Alta., Separate School Board it was decided that a new four-roomed school be erected this summer. It will be of solid brick, with stone trimmings. Competitive tenders will be called for at once.

The tenders for a new Presbyterian church at Fort William were opened on June 4 and were found to be so much in excess of the price anticipated that it was decided to revise the plans. The congregation were prepared to spend \$60,000 on the edifice.

Plans are being prepared in St. John, N.B., for the erection of a new building for the Temple of Honor and a hall for the St. John the Baptist Society. It is understood that both structures will be of brick and each will cost in the vicinity of \$10,000 or \$12,000.

The plans of architect H. Lines, of Edmonton, have been accepted by the Prince Albert high school board for the erection of a new high school this summer. The estimated cost is \$75,000. Tenders will be awarded about July 1. The plans provide for nine class rooms, a large assembly hall, toilet rooms and bath rooms.

The Dominion Government has purchased about one thousand acres of land near Prince Albert as a site for the provincial penitentiary. This includes Emmanuel College grounds, sold by the English Church for \$15,000. The latter are negotiating for the purchase of a building site near the high school, on which to erect a divinity college.

Keith & Plummer, and Franklin Clark, of Hartland, are clearing ground at St. John, N.B., preparatory to the erection of large brick buildings, that of the former to be 60x80 feet, and that of Mr. Clark to be 30x60 feet. The buildings will form a solid brick block, two storeys high, with a concrete basement.

Waterworks and Sewerage.

A \$7,500 sewerage system is proposed for Mimico Industrial School.

Norwich, Ont., will construct between 3,500 and 4,000 feet of sewers.

Elmira, Ont., may spend \$25,000 for the extension of the waterworks.

Galt ratepayers will vote on a by-law to issue \$50,000 for the purpose of constructing a sewerage system.

Victoria, B.C., is considering the installation of a more complete system of surface drains for the city.

A general sewerage system is proposed to be constructed in Stadacona and Lairet Wards, Montreal.

St. Louis, Que., council will submit a by-law to the ratepayers for the purpose of laying water pipes to cost \$180,000.

Tenders are being asked for the installation of the waterworks plant proposed for the penitentiary at Prince Albert, Sask.

The V. Stanton Iron Company, London, Eng., has received an order for 300,000 tons of iron piping for water, gas and other public works, from the city council, Victoria, B.C.

Victoria city council awarded the contract for steel-riveted pipe for the waterworks plant to the Hydraulic Supply Co., Seattle, Wash., and the Robertson Iron Works was awarded the contract for laying the pipe.

The Saskatoon board of works are mapping out a plan for the extension of sewer and waterworks. An immense water tower has been built on Nutana hill and pipes are being laid between it and the power house. The supply will have to cross the new traffic bridge, for which brackets and pipes have been ordered.

Wallaceburg, Ont., council last week granted R. L. Pattinson and associates, of Buffalo, a 25-year franchise for supplying natural gas to that town. If the natural gas supply plays out, the franchise is good for artificial gas. Mr. Pattinson expects to be supplying Wallaceburg early next fall.

At a meeting of the council of Preston, Ont., the contracts for the various work on the town's system of sewerage were let. The Concrete Engineering & Construction Co., Toronto, were awarded the contract for laying of the sewers, and the Canadian General Electric were awarded the contract for the pumping apparatus.

There is every reason to believe that the citizens of London, Ont., will be enjoying natural gas by the time winter fairly sets in again. The company which is to lay a pipe line from the Port Dover gas field to this city has been duly organized, and work will be commenced with as little delay as possible. It will take about ninety days to construct the trunk pipe line, which will be about sixty miles in length.

Plans of Galt & Smith, consulting engineers, Toronto, for a complete sewer system and sewerage disposal works, have been accepted by the Vernon, B.C., Council. The general system will consist of about five miles of pipe sewers, sizes 18 to 8 inches diameter, with all the necessary appurtenances. The first will consist of a septic tank, with a continuous filter, and provision will be made for future extensions. Estimated cost \$57,500.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, June 29.—Prospects look very hopeful at present and while there is not as much work as last year yet there is sufficient to keep the plumbers fairly busy. Although there is a falling off in the amount of money spent on houses this year, there is not the same proportionate decrease in the number of houses being erected in Montreal and the immediate vicinity. The fire at Three Rivers will stimulate trade a little and travelers are already on the scene figuring on heating systems for the new places of business and hotels that will be erected. Hotels must go up at once and with the insurance and the proposed government loan a new and better city will rise from the ashes. The prospects for the fall trade are good.

Iron Pipe—There is a fair demand for iron pipe for immediate use. We quote: 1, 3 and 1-inch pipe at \$2, \$2.25 and \$5.28 for black, and \$2.86, \$3.08 and \$6.93 for galvanized.

Soil Pipe—Some large orders have been booked. We quote: Light, 3 to 6 in. 60 off; medium and heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

Lead Pipe—There is a good demand and we quote pipe and waste at 30 off.

Solder—Trade from the towns in the vicinity of Montreal is greater than in the city. Prices are unchanged.

Enamelware—Houses that were started in March and April are ready for the enamelware and there is an increased demand for this line of goods. There are several large buildings and apartment houses going up which will necessarily take a quantity of first-class goods, but there are more of the smaller class of houses ranging from \$1,500 to \$3,000, which take a very cheap line. Manufacturers are expecting a very good fall trade, although the spring pointed towards a very poor year.

Brass Goods—Standard goods are in demand with prices unchanged. Compression work is quoted at 65 per cent. and fuller work at 70 per cent.

Radiators and Boilers—Orders are heavier and as the buildings are advancing the demand becomes more pronounced. We quote radiators at 52½ off and boilers at 50 and 10 off.

Metals—There have been few changes. Copper is stronger. Tin has struck its lowest level. We quote: Ingot copper, \$13.75; ingot tin, \$28.20; lead, \$3.60; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, June 29.—Picking up seems to express the condition of the plumbing trade. Business is better than a

fortnight ago and June appears to be the best month so far this year. City work continues to advance more rapidly than country work.

Prices in iron pipe have declined somewhat and solder and caulking lead are a little firmer. An advance of 40c is made on porcelain closet combinations, this charge being made for the crating and not for the closet itself.

Iron Pipe—Both on galvanized and black prices have declined, one-inch galvanized now being quoted at \$6.76 and one-inch black at \$5.11. Cast iron fittings remain unchanged at 65 and malleable fittings at 37½ off. Stocks are fairly large and demand is fully equal to any fortnight since the early spring.

Soil Pipe—Like iron pipe supplies and demand of soil pipe are fair. Prices are still the same as last quotations: Light pipe 60, and fittings 70 per cent.; medium and extra heavy pipe and fittings remain at 70 per cent.

Lead Pipe—Quotations on pipe and waste are still at 30 and traps and bends at 50 per cent. Caulking lead is firmer at 5c, ½ cent above last quotation. Business fair and prospects good.

Solder—Prices are now at 20c for half-and-half, and 18½c for wiping solder, a slight advance over last quotation. Business continues fair.

Brass Goods—This line continues rather dull. A decline of about 5 per cent. on some brass supplies is promised before another fortnight. All other lines, however, seem likely to remain at present quotations. Fuller work is still at 70 per cent. and for compression work 65 per cent. is charged.

Enamelware—We continue to quote \$7.20 on "A" quality and \$6.60 on "B" quality rolled rim sinks. There is likely to be a decline very soon on a number of lines of enamelled baths. Business is now good for all grades of enamelware and prospects, too, look rosy.

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Porcelain Closets—While closets remain at old quotations there is an advance of 40 cents on combinations, the charge being made for crating.

Boilers and Radiators—Boilers and hot water and steam radiators are very good sellers just now. In fact more boilers are going out this year than was the case a year ago, and June seems to be an especially good month. Prices are unchanged.

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In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

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Contract & Estimate Record Book for Plumbers (Pocket edition). By B. H. Jessup	50	Modern Sanitary Plumbing, Steam & Hot Water Heating. By J. J. Lawlor	5 00	Sanitary Engineering of Buildings. By W. P. Gerhard	5 00
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External Plumbing Work. By J. W. Hart	3 00	Outline of Ventilation & Warming. By W. J. Baldwin	1 00	Sanitary Plumbing & Drainage. By J. W. Hart	3 00
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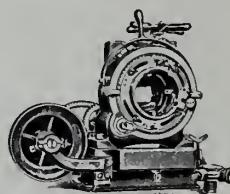
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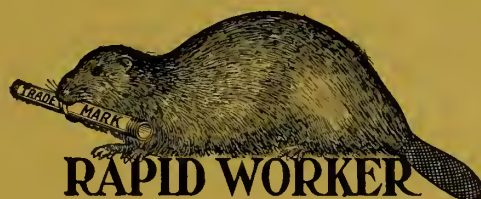
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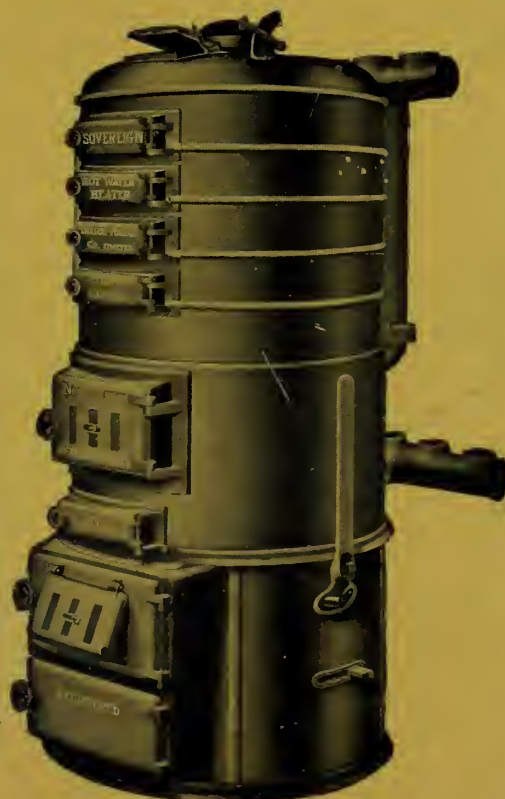
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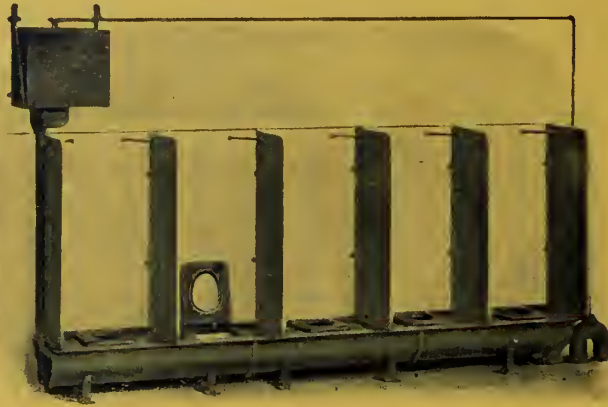
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What You Want is the "King." No other Radiator is like it—superior castings, consistent ornamentation—"A thing of beauty and a joy for ever."

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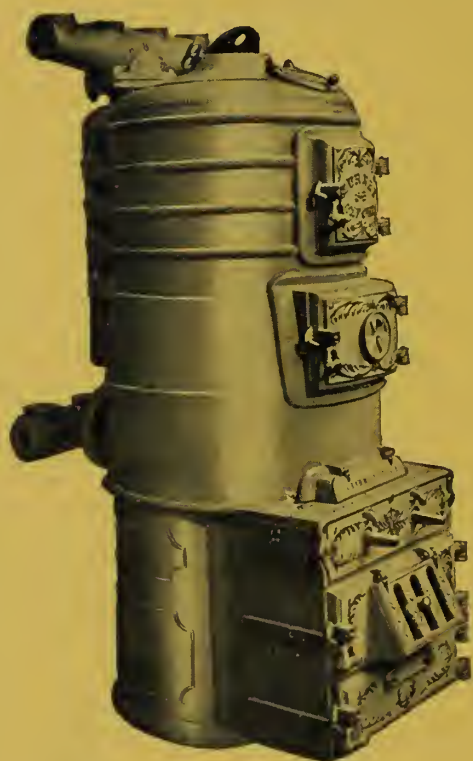
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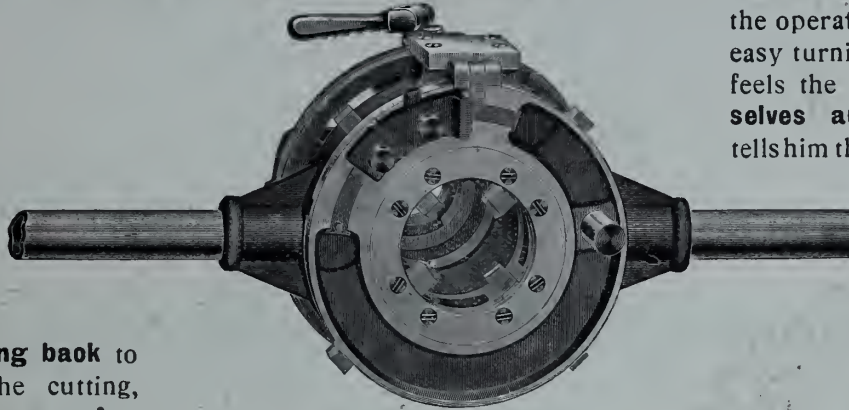
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the operator simply does the easy turning around until he feels the **dies release themselves automatically** — that tells him the thread is finished.

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The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

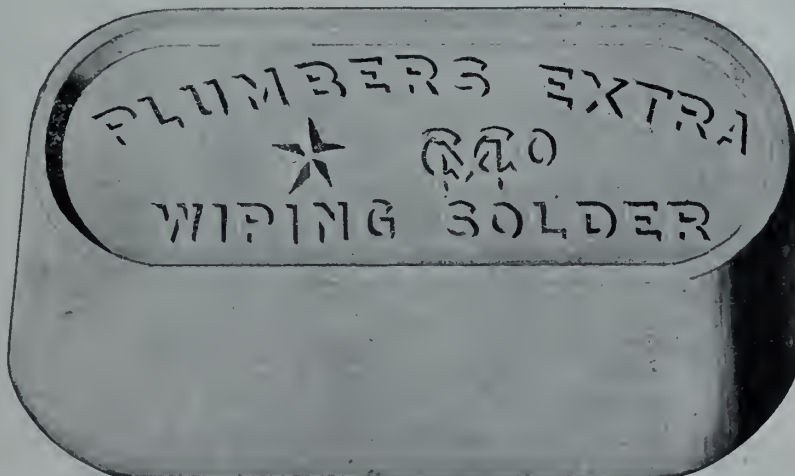
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Solders come and go,
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Star Extra
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We ask a fair price for quality and it's worth it.

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9,000 Systems in Use in America.



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We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

While our Canadian representatives will give their attention to making the trade on this side acquainted with the merits of the Honeywell System of Hot Water Heating and render engineering advice to the interest of the fitters, we will not fill orders direct for our specialties, but will supply the trade entirely through the established Canadian dealers.

The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



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COMBINED WASTE AND OVERFLOW

FOR BATH TUBS

Patented August 1st, 1905

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Note convenience of Overflow and Waste being on the same line, thereby requiring no "Special" roughing-in.

Accessible for cleaning.

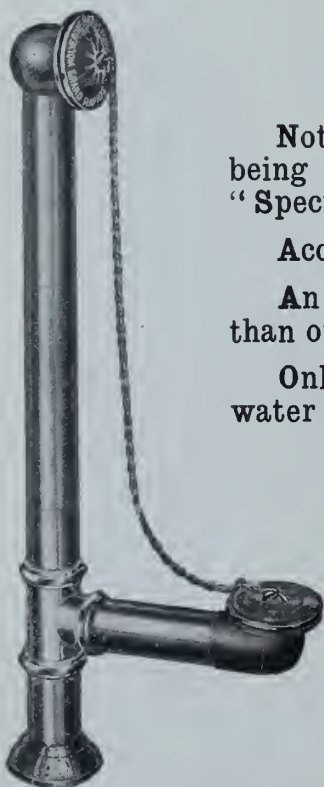
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Only three inches of waste piping above the water seal.

Heavy cast brass overflow strainers, with 33 spaces for customer's name and address.

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KENNY FLUSHOMETER SYSTEM



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MONTREAL, TORONTO AND WINNIPEG, JULY 15, 1908

ATTENDING THE CONVENTION.

The Toronto Master Plumbers' Association, after giving the matter full consideration, have decided that they are unable to invite the National M.P.A. to hold their convention at Toronto this year, so notices will be sent out at once by National Secretary Knox, giving the exact dates and meeting place of the 1908 gathering, which, it will be remembered, was announced as August 6 and 7 at Montreal. It is possible that later dates may now be chosen, however.

The 1908 convention should be even more largely attended than last year's gathering, and business, rather than entertainment, should be the aim of the delegates. The Maritime Provinces were well represented last year and there was some talk of the eastern delegates inviting the National convention to meet at Halifax. They may put up a fight for the 1909 meeting. Quebec, Montreal and Ottawa are sure to be well represented. Renewed interest in association matters is being manifested in Toronto and Western Ontario and it is expected that several delegates will attend the convention from this district, with the intention of securing the 1909 convention for Toronto. North Bay, Port Arthur, Winnipeg, Calgary and Vancouver are also expected to be represented.

Master plumbers everywhere should unite in making this year's gathering a turning point in the history of association work in Canada. Better sanitary regulations are required. Under-bidding on contracts and scamped plumbing jobs must be discouraged by the educational work of the association. There is plenty of work to do and each one in the trade should be prepared to do his part by attending the convention and helping along the good work of the association.

PLUMBERS—GET TOGETHER.

Through association on well laid and reasonably conducted lines master plumbers can accomplish a great good for themselves and the public. In union there is strength. Recognize yourselves, and the public respect will be yours.

Through an association plumbers can learn much and accomplish easily what no individual could do single-handed.

The great advantage and necessity of the plumbing trade can be much better presented to the public by proper association work.

Association does not necessarily mean a combine or trust outside the face of the law. There are better and more rational methods of bettering the status of the trade.

Architects, house-owners and the public in general demand increasing betterments of sanitary conditions and all such work must pass through the plumber.

The better the status of the plumbing trade the greater are the benefits he as well as the public will reap.

Don't take it all out in considering and thinking, but act. Send the Plumber and Steamfitter an expression of your views. This means you—the plumber who is reading this.

GOOD WORK AND MATERIALS MOST PROFITABLE.

With the steady improvement in plumbing work, and the advancement of the status of the plumber, the practice of using the cheapest material is rapidly falling into disuse. The time was when on some class of work only the cheapest article was used, and the life of the valve, pan, or fitting as the case may be, was of the shortest description. But with his growth of education, the plumber recognizes that upon the character of his work, and upon the durability of his materials, rests his reputation, and that with a careful landlord, a plumber who puts in cheap stuff only gets the one chance.

Of course, so long as excessive competition exists; so long as the lowest tender gets the contract; so long will there be a direct inducement to a man to secure his profit on cheap materials. But work of this kind does not pay the plumber in the long run. His reputation suffers. He becomes ostracised by reputable builders, and once having catered for poor class of work, he has to continue, with consequent loss of standing and character. The average landlord has much to learn with regard to plumbing work. He accepts tenders at ridiculous prices—prices at which common sense should show that good material could not possibly be put in—and then some months afterwards, is surprised to find various parts of the plumbing showing wear and tear, or perhaps absolutely worn out and useless. The plumber is then blamed for the whole occurrence, and probably never gets another chance of showing what he could do under a fair profit test. Only by standing out for a fair profit can the plumber put in that class of goods which will reflect credit upon himself and upon his work. Again there are a number of men who always will, in a short-sighted way, put in cheap materials to get a larger profit, even though the contract may be a just one permitting of fair returns with the best work. The far-sighted plumber, however, realizes the absurdity of doing shoddy work, and will not undertake or tender for a job at a price which cannot possibly allow for the using of good ma-

terial. These men, unless they are in the foremost rank of their trade, have a hard road to travel, but by standing out for a fair profit and the employment of the best article, they are enhancing their reputation and helping forward the standard of plumbing generally.

That there is room for further improvement it is admitted, but that there is an improvement can be seen from the lessening number of cheap articles that are on the market. Cheap brass goods, for instance, are now somewhat of a drug on the market, but the standard lines have kept their values well, despite the low prices of copper. The reputable jobbing houses, too, are doing good work in pushing only the best lines, and it is evident as this reformation goes on they will stock nothing but the best quality. All credit is due to the plumbers—and their numbers are increasing every day—who not only steadily stand up for a fair working wage, but who are prepared to cut their profit to put in articles that reflect credit upon them and the supply house, and give the utmost satisfaction to the landlord and tenant.

PLUMBERS' TRADE JOURNAL'S KIND WORDS.

More than a quarter of a century ago the Plumbers' Trade Journal, (New York), was established and its long record of usefulness has placed it in the front rank of trade newspapers, as well as high in the esteem of the plumbing and steam fitting trade in all parts of America. In its July 1 issue the Plumbers' Trade Journal editorially expressed its strong condemnation of scamped plumbing work and loose methods of inspection, while expressing hearty approval of the stand taken in recent issues of this paper in favor of a higher standard of plumbing work in Canadian cities. The journal's editorial follows:—

"The Canadian Plumber and Steamfitter, in an editorial in one of its April issues, comes out boldly in strong denunciation of the present plumbing practices in the city of Toronto, which are tolerated by the city plumbing department. It cites a case discovered recently where a so-called plumber installed a kitchen sink to which was attached a dummy vent, unconnected to any soil pipe, the job, in addition, being done without a permit. Inquiry disclosed that the case was by no means an isolated one, the practice seeming to be common in certain districts. The Toronto city plumbing department when asked for particulars of cases like this, refused, contending that the publication of information of this kind would injure the city, and that inspectors were appointed to look after that kind of work. The Plumber and Steamfitter investigated for itself, and found shocking conditions existing, and in the interests of the plumbing fraternity, and in an endeavor to secure more efficient plumbing inspection, and indirectly a higher grade of work and better prices in Toronto and other Canadian cities, it has exposed these unsanitary conditions and is continuing the agitation for better plumbing legislation, as it is aware that the interests of the legitimate plumbers and the health of the community will be at stake, if existing plumbing practices continue.

"It is greatly to be regretted that such conditions exist in the city of Toronto and other Canadian cities, and it redounds to the credit of The Plumber and Steamfitter that it has undertaken to give publicity to such insanitary practices which are being perpetrated upon the unsuspecting public by some of these so-called plumbers. Their

commendable object is in waking up the legitimate plumbing fraternity to the necessity of joint action to protect their trade, and raise it from the rut into which it has surely fallen.

"Some of the older readers of the Plumbers' Trade Journal can remember the time when conditions in the plumbing trade in this country were at a very low ebb, and they also will recollect the part that this journal played in bringing to the attention of the trade at large the deplorable and regrettable conditions then existing, pointing out possible remedies and advocating united action and loyalty among the members. Other influences were brought to bear, and once the idea of reform took root, it grew rapidly.

"It has been the life work of the Plumbers' Trade Journal to impress seriously upon the plumbing fraternity that it should be their united and conscientious effort to promote, uplift and raise this greatest and most important trade to the high position it should hold, and which it now occupies. And so it is very gratifying to us to see our Canadian friend, The Plumber and Steamfitter, following in our footsteps and taking up in all earnestness this very important question. That it may have the glorious success which has attended the former efforts of the Plumbers' Trade Journal is our sincere wish."

NEW BATHROOM CONVENIENCES.

A new device recently introduced is a fixture that will receive the collar buttons, studs, tie and collar. It is fastened to the wall for convenience. This little novelty has three arms, the centre one straight and those on the outside curved, so that it resembles a lyre when laid flat. At the base of the lyre is a small open box, on which to place the studs. The tie hangs over the straight bar and the collar or cuffs depend from the curved bars, altogether a most convenient hanger.

Another new attachment is for taking tooth powder from the holder. The holder itself is funnel shaped, but flat, with a little lid at the top, and the bottom or point is a catch which takes the toothbrush, holding it much more securely than can be done by the hand, so that not a speck of powder can possibly be spilled when the tiny handle is revolved which releases the powder. Being secured to the wall, the powder can not be mislaid, as it is apt to when contained in a bottle.

The bath mats to prevent slipping while taking a bath, are not particularly new, but they show quite a few original features. For instance, the average bath mat, as every one knows, must be stepped upon exactly in the middle when either entering or leaving the bath, while the new mat provides strapped hooks near either end which rest on the sides of the tub in much the same way as the bath seat, except that, of course, the mat rests on the bottom of the bath. In this case it is impossible for the mat to slip. There are a number of persons who, either through a deformity or very much weight, find it inconvenient to reach the middle of the mat when leaving the bath, so that these will probably take advantage of the improved feature. The mats are of rubber, of course, and in passing it should be said that care in drying is necessary to the life of the rubber. The better quality mats are provided with a rod and hook made especially for the purpose of drying. The prices vary with the size of the mat, which runs from 30 inches in length to one the full length of the bath tub.

Plumbing of Public Schools

Address by Chas. M. McHugh, Plumbing Inspector, Cedar Rapids, Iowa, Before the Recent Convention of the American Society of Plumbing and Sanitary Engineers.

In 1902 a plumbing ordinance was passed and a plumbing inspector appointed by Cedar Rapids, and in 1904 one of our public schools was enlarged and remodelled throughout with plumbing. The architect had drawn plans and specifications for a latrine system of plumbing, but as this did not comply with the requirements of our plumbing ordinance exactly, I forbade its installation, permitting, however, the installation of an individual, double siphon, closet range. But it was but very little better than the latrine system, the only improvement being the enamelled inside, a seal of water in the bowls, and the fact that it was somewhat easier to keep clean.

Individual Closets for Each Room.

Two years ago we had another school remodelled, and as the range closets and the individual bowls in group fashion were something that we did not approve of with the experience that we had had in the past years, both in sanitary and moral respects, we communicated with several school boards in large cities throughout the country in regard to different styles of plumbing in public schools, but found none to suit the people of Cedar Rapids. We then thought that we would install a system of individual closets in individual rooms one for the boys, and one for the girls, off each schoolroom and one enamel lavatory for the boys and one for the girls, properly ventilated in every form.

The closets are of the best hard burned, perfectly vitrified earthenware of the siphon wash down pattern, having heavy lugs for attaching of seats and low down tank. Each bowl has a connection off the bowl, 3 in. in diameter, for local ventilation. This vent connection is made of iron pipe, enamelled inside and outside and connected to the closet bowl and vent shaft and continued up through the building.

Disuse of School Urinals.

The closet bowls are set on polished slab floors of pink Tennessee marble of the most dense and nonabsorbent texture, 1½ in. thick, and countersunk ¼ in. which is kept clean very easily. In this way the pupils are under the control of their teacher while school is going on and have no opportunity to congregate in rooms where group closets are installed. It will avoid the learning of

bad habits and the telling of immoral stories, which often is a result of such congregation of pupils in remote and unguarded places. In this way urinals are abandoned entirely, which is quite desirable, I think, as the best of them is an insanitary fixture in school buildings at any time.

Objection to this arrangement might be raised on the ground that the closets would become insanitary fixtures by thus using them in place of urinals. But I find on close investigation of this system, which has been installed two years, that the closets are as clean as the day they were set, and but very little work is required by the janitors to take care of them and not any more than under any other system. The relief from influences tending to coarseness is an element of the situation that should commend itself to the consideration of anyone.

Objections to Arrangements Answered.

Again, it might be said that the stoppage of a closet of a schoolroom of this style would cause inconvenience to the pupils of the room; but as there is usually an emergency closet on every floor of the building and sometimes two, for the use of the teachers, these could be used by the pupils of the room in which the closet was out of repair, until their closets were repaired, which would be only a very short time. Another objection is perhaps this, that the stoppage of a closet would be liable to cause overflow and leakage to the other floor below, but this is a matter that can easily be taken care of while the plumbing is being installed, by the use of safe wastes.

Some might think that all sorts of trouble would be caused by delicacy on the part of the pupils to enter the closets while other pupils were in the room on account of the noise of the water when discharged from the tank, which would be so noticeable that a commotion would be caused in the schoolroom, but as the closets are located far from the schoolroom, the cloakrooms being between it and the toilet room, and as the closets are of the most noiseless construction, it causes no commotion whatever.

Both Sanitary and Moral.

Taking it from a sanitary standpoint a moral standpoint and an educational

standpoint, I consider it is a system well fitted for public schools. It will educate pupils to be cleaner and also give them an idea of how plumbing should be used in the schools and at their homes. It will make them more careful about the use of plumbing, for in case one pupil misuses the closet by stoppage or in any other way, or the lavatory, you may rest assured that the next pupil who enters the toilet room will be liable to report what had been done by mischief, for fear that he or she would be liable for the punishment of the same, and taking the whole in consideration, I believe it to be the best for public school buildings that I know of.

Another good feature in regard to this system of individual toilet rooms is that the janitor claims that it is a great saving on toilet paper. He claims that since this system has been installed it does require only about half the amount of toilet paper that was used under the group system of closets. It does away with the use of toilet paper for making paper balls and throwing them at each other in the toilet room, and unrolling it off the rack just to be doing something while they are not under the guard of the janitor or the principal of the school building. This system, I believe, is a more homelike system, causing pupils to use it in school the same as they would in their homes.

Will Extend the System.

When we installed this system of plumbing we first thought of removing the toilet rooms to a separate building some distance from the school, but we have seen that plan in operation in other public buildings and realize that it would not answer all purposes that we want a school building for; such an arrangement would only relieve the sanitary part of the trouble and would not do away with the source which was quite as detrimental to the discipline in the school building as were the toilets detrimental to the sanitation part.

We have twelve public school buildings which contain an average of about 500 pupils to a school and about 36 or 37 pupils to a room. This coming season we intend to remodel two more schools with the same system, as it has proved a great satisfaction over any other system that we have experimented with

or have heard of, and it will only be a matter of a short time until we have provided all our schools with this system, unless we can see something better, and if there is we are willing to test it.

This system is ventilated with a forced ventilation from every toilet room and with local ventilation off the bowl. I have tested the air of the toilet rooms and find it to be much purer than I find it where group closets are placed.

The reports from the superintendent, the principals and the janitors of these two schools in which we have installed this system are to the effect that they would not want to go back to the group system of closets under any consideration. The chairman of the Building Committee on the School Board is also very much in favor of this system. Most of these people were formerly opposed to this system, but allowed us to give it a trial, and now they give it their most enthusiastic endorsement.

Michigan's Regulations Governing Sewerage of Schools

Details of Plans Which Must Be Followed in the Erection of School and Other Public Buildings in Michigan.

The State Department of Health of Michigan, in its quarterly bulletin, makes some strong recommendations in the matter of sewerage which are a fitting complement to the regulations governing the ventilation and heating of public buildings in Michigan, as outlined in *The Plumber and Steamfitter* of June 15.

The proper ventilation of public buildings would not be complete were the matter of sewerage neglected. Were all the known rules governing the ventilating of a building complied with and the one matter of sewerage overlooked, the work would go for nought, and so far as sanitary accommodations to safeguard health were concerned it would be a sheer waste of time and effort.

All over the world, public opinion seems to be waking to the fact that without proper sewerage systems and sanitary arrangements the health of people cannot be guarded.

Michigan Sewerage Requirements.

The use of stoneware pipes under buildings is not approved, for the reason that they may be easily broken by the settlement of buildings, or by the expansion and contraction of long lines of soil or waste pipes which might be connected with them. It is recommended that only iron pipes, of the grade known as "extra heavy," with caulked lead joints, be used for the sewers on the inside of, and for a distance of at least five feet outside, a building.

The connection of tile subsoil drains with a sewer is not approved, because in the event of a stoppage in the sewer, the subsoil would be liable to contamination by sewage, and for the further reason that any trap which might be interposed between the subsoil drains and the sewer would be liable to become dry and allow of the passage of sewer air into the ground under the building, from whence it might find its

way into rooms above. It is recommended that every subsoil drain be made to discharge into a land drain, or into a ditch or other natural water-course; but where this is not practicable they should discharge into a porous piece of ground, or, where the land has a sufficient slope from the building, on to the surface of the ground, at a safe distance from the building.

Direct Connection With Public Sewers.

The direct connection of private sewers with the public sewer is not approved, for the reason that, in the event of a defect in any part of the sewerage system or the drying up or siphonage of any trap inside a building, air from the public sewer would have access to the interior of the building. It is recommended that a self-cleansing main trap be placed in the sewer of every building, with fresh air and inspection openings at the grade, in addition to which the vertical soil and waste pipes should be continued above the roofs to complete the arrangements for the ventilation of the sewer.

When several buildings of an institution are connected with a common private sewer, one main trap and one air inlet near to the same may, usually, be made to answer the purpose of disconnection, and such an arrangement would allow of better ventilation of the sewerage system and reduce the number of possible sources of stoppages (traps) to the minimum.

The ventilation of sewers through rain conductors is not approved, because sewer air would thus be discharged in the vicinity of and, in many instances, immediately under, windows, and so gain access to the interior of buildings. Recommended that, wherever possible, the rain conductors of a building do not discharge into sewers, but where this is not practicable, they should be made to converge to one point and be connected

with the sewer through one trap only, and provision should be made for maintaining the seal of this trap during a period of dry weather.

Terminals of Soil Pipes.

The termination of a soil or waste pipe, at the roof, below windows on an upper floor, or in the vicinity of roof lights which are made to open, or near to the top of a ventilating or smoke flue, not approved, for the reason that there would be danger of sewer air gaining access to the buildings when the wind was blowing from the direction of such pipes toward these openings and when there might be a down draft in any such flue.

The placing of fresh air openings in sewers in close proximity to buildings is not approved, for the reason that with a reversal of the air currents in the sewers, such as would be caused by the discharge of fixtures on the upper floors, sewer air would be discharged from these openings, and might find its way into the buildings through open doors or windows, or through the fresh air openings of the ventilating plants. Recommended that the fresh air inlets to sewers be located as far as practicable from the buildings, and that, wherever practicable, they be located on the sides of the buildings where they would be the least likely to become sources of danger or offence.

"Catch-basins" and Manholes.

The use of more than one "catch-basin" for one building, not approved, for the reason that they are, of necessity, filth arresters, and while they are considered to be necessary for the interception of bulky articles which the inmates of certain state institutions carelessly or wilfully put in the water closets, their number should be restricted to one for each building, and, wherever practicable, to one for the several buildings of any institution.

"Catch-basins" and manholes located in close proximity to buildings, not approved, for the reason that foul air may be blown from them into the buildings through open doors or windows or through the fresh air openings of the ventilating plants. Recommended that all "catch-basins" and manholes be as far from the buildings as practicable; but where they must be located near to the buildings, or on the sides of the buildings from which the wind most prevails, they should be provided with tight covers. Where this would interfere with the proper ventilation of the main sewers, the latter should be ventilated by the grated covers of those manholes not in dangerous locations, and by special pipes carried from the most suitable points in the sewers to points above the roofs of buildings. If the suggestion, previously made, relative to

the use of but one main trap for the several buildings of any institution, should be adopted, the ventilation of the sewerage system could be accomplished, without the grade openings at the man-holes, or "catch-basins," by the air inlet near to the main trap in conjunction with the extensions of the soil and waste pipes above the roofs.

Soil and Waste Pipes.

The location of a soil or waste pipe in a ventilating flue, or in any wall or other sealed enclosure, not approved, for the reason that, in the event of a defect in the pipe, sewer air might escape into the building for a long time without being detected, and for the further reason that the inspection and repair of pipes in such locations would be difficult.

The use of galvanized sheet iron pipes for trap vents, or for rain conductors having sewer connection and located inside buildings, not approved, for the reason that such pipes would soon become weakened, if not perforated, by corrosion, and for the further reason that, as usually made, the joints of such pipes are not considered safe.

The use of bell traps in any part of the sewerage system of a building, not approved, for the reason that such traps are easily broken, have very shallow water seals, and are unsealed whenever the covers are raised, which is usually rendered necessary to permit of the ready flow of water to the sewers. An extended observation has shown that whenever raised, the covers of these traps are usually left off for considerable periods of time. Where used inside a building, in connection with the sewerage system, such traps are a constant source of danger to the health of the occupants, and should be relegated to the scrap heap at the earliest opportunity.

Basement Toilet Rooms.

The location of toilet rooms containing urinals and water closets in the basements of buildings without impervious ceilings and floors between such rooms and the rooms above, not approved, for the reason that, following the usual movement of air in a building, air from the toilet rooms would be constantly passing into the rooms above. Recommended that whenever a toilet room in a basement is deemed necessary, the ceiling and floor, or the space between the ceiling and floor, immediately over such room, be rendered impervious to air; also, that the entrance to the toilet room be so arranged that the air which may escape from the toilet room during the opening and closing of the door cannot find its way into corridors or rooms above by way of a staircase.

The location of water closets in rooms which have not at least one out-

side window, not approved, for the reason that direct daylight and ventilation by windows are considered essential to proper hygienic conditions in such rooms.

The connection of the clean-out pipe of a fresh water tank, or the overflow pipe of a rain water cistern, with any part of the sewerage system not approved, for the following reasons:

As usually arranged, the clean-out of a water tank is also made to serve as the overflow, and is trapped below the tank, but unless the tank overflows or is emptied quite frequently, the water seal of the trap will become lowered by evaporation and may allow sewer air to pass into the building.

Notwithstanding that the overflow of a rain water cistern may be well trapped, there will be many seasons when the rainfall would not be sufficient to keep the trap sealed and under such circumstances, sewer air would be likely to pass into the cistern and from thence into the building; or, in case the cistern was outside the building, sewer air would be likely to be discharged into the air at a point too near the building to be considered safe. Recommended that the waste and overflow pipes of tanks and cisterns for the storage of water be made to discharge into or on the ground at a proper distance from buildings; but where this is not practicable, they should be made to discharge over sinks or floor drains, the traps of which are frequently flushed.

Refrigerator Drainage.

The discharge into a sewer of the waste water from a refrigerator, either through a surface drain in the floor of same or through a trapped waste pipe, not approved, for the reason that the food in the refrigerator would be in serious danger of contamination by sewer air whenever the water seal in the trap might become reduced by evaporation, or the pressure in the sewer might be sufficient to drive air through the trap (a not infrequent occurrence). Recommended that the floor drainage of a refrigerator be accomplished by a surface gutter leading to a trap outside and at a safe distance from the refrigerator; or, if the refrigerator is provided with a waste pipe, by causing the latter to discharge on the ground outside, or over a well trapped sink or floor trap, which is frequently flushed and into which foul liquids are not discharged.

In one set of plans submitted for examination, provision was made for the joining of the horizontal iron sewer under a building by means of portland cement. This was not approved.

The use of "T" fittings for the branches in the horizontal sewer, and, as a rule, in the vertical soil and waste pipes, not ap-

proved, for the reason that the flow of sewage from the branches to the mains would be thereby checked, in some instances to the extent of causing deposition of the solid matters in the sewage at those points. Recommended that wherever two sets of sewer pipes are to be connected at right angles to each other, a "TY" fitting, or a "Y" fitting and $\frac{1}{4}$ bend, be used for the purpose.

The use of a by-pass, whereby crude sewage may be temporarily diverted away from a septic tank and made to discharge, unpurified, into a natural water course, not approved, for the reason that if at any time it is wrong to discharge crude sewage into a natural water course—and the existence of the septic tank would be evidence of that fact—it is certainly wrong to do so even temporarily. Recommended that where it may be necessary to divert the crude sewage away from a septic tank for a short time, provision be made for its discharge on to the surface of a well drained and porous piece of land, such as would be considered suitable for the purification of the sewage by the irrigation method of disposal, and located at a safe distance from any source of water supply.

The discharging of the sludge from a septic tank into a natural water course, not approved, for the reason that the latter would be badly fouled thereby. Recommended that provision be made for discharging the sludge on the surface of a piece of porous land, and for its subsequent burial by plowing or spading. The same piece of land could be used for the temporary reception and purification of crude sewage, as outlined in the preceding paragraph, and also for the disposal of the sludge.

Clothes and Dust Chutes.

The location of a clean-out at the base of a dust chute in a basement room which is used for a fresh air chamber, not approved, for the reason that it would be impossible to remove the dust from the chute without serious contamination of the air supply. Recommended that dust chutes be not used in any building; but where they may be considered desirable or necessary, they should be constructed next to outside walls, so that the clean-out doors can be made to open to the outer air.

The location of a door at the base of a clothes chute in a basement which is used for a fresh air chamber, not approved, for the reason that the air supply would be contaminated, and possibly infected, by the handling of the dirty clothing, bedding, etc., in such a room. Recommended that each clothes chute be made to open into some part of the basement not used for a fresh air chamber.

Modern Features of Country Plumbing

Septic Tank and Filter Bed Used Under Special Circumstances Described by R. M. Starbuck in the Plumbers' Trade Journal.

In previous articles we have endeavored to give not only the general principles involved in the purification and disposal of sewage of isolated plants which are not provided with the advantages of a public sewage system, but have also showed the application of such principles to the disposal of sewage under special conditions. A condition which often arises is that in which

lem in the case of filter beds being even more difficult than in the case of sub-soil irrigation.

Methods of Application.

Among the various methods which have been applied to this particular problem is one which we illustrate in section in Fig. 1, and in plan in Fig. 2. This method necessitates the use of an

Figs. 1 and 2, the accumulated sewage is discharged in this way into the adjoining septic tank, and from the latter it overflows onto a filter bed constructed of broken stone. A connection at the further end of the filter bed carries the liquid after it has passed through the filter bed, to the point of final disposal. The system should be provided as shown, with a by-pass having a gate valve, by means of which the septic tank may be drained when necessary. The system which we show has been used in a town in New Jersey, in connection with the disposal of public sewage.

We believe, however, that better results might be obtained from the filter bed if some device were used for distributing the sewage more evenly over the filter bed. It is always the best practice to give all parts of the filter bed an equal amount of sewage to take care of, and when this is done the filter bed will give good results for a much longer period of time than otherwise.

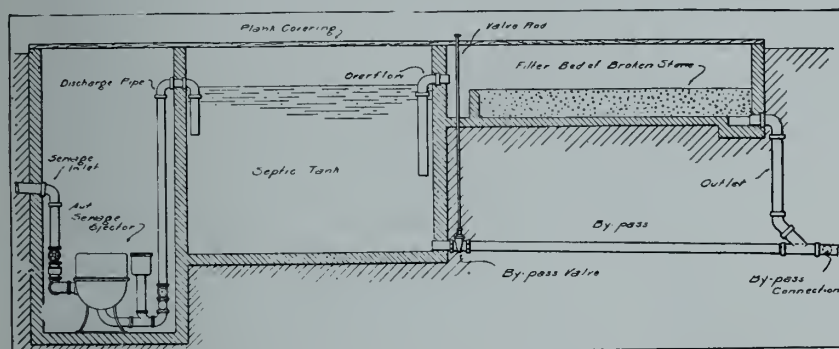


Fig. 1—Sectional View of Septic Tank, Filter Bed and Automatic Sewage Ejector in Combination.

disposal of sewage has to be made in level sections of country, and especially where the plant from which the sewage is derived is necessarily at a considerable distance from the point at which the process of purification is to take place.

It will be very clearly seen that under these conditions, the absence of any natural grade of the surface of the land, prevents disposal and purification by the means which have already been described. For instance, it would often be impossible to discharge the contents of the septic tank into a system of sub-soil irrigation, for the reason that the septic tank under existing circumstances would have to be so deep that in discharging by gravity into the underground piping, the latter would have to be laid at a depth so great that no purification of sufficient thoroughness could be performed, owing to the fact that bacteria could not exist in any great number at such a depth below the surface. These bacteria depend for their existence upon a supply of oxygen from the air, and air will not penetrate most soils sufficiently for this purpose to any such depth as would be necessary under the conditions which have been mentioned. The final disposal of sewage from a septic tank into filter beds would be impossible for the same reasons given above, and for other reasons, the prob-

automatic sewage lift or ejector, with the proper means of providing power for its discharge, and in some instances this would operate against its adoption, owing to the matter of cost that would be entailed.

Automatic sewage lifts are generally constructed for operation by either electricity, water pressure, or compressed air.

Briefly stated, their action is the fol-

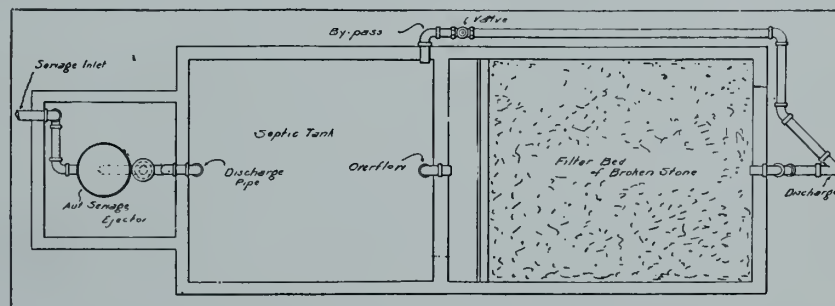


Fig. 2—Septic Tank, Filter Bed and Automatic Sewage Ejector in Combination.

lowing: The liquid waste which enters the receiving chamber, gradually raises a float, and when the level of the liquid has reached a certain point, it automatically sets in operation the motive power, which forces out of the receiver and into the discharge pipe, the entire contents of the receiver.

In the purification system shown in

Before leaving this subject there remains to be considered the septic cesspool, one form of which is illustrated in Fig. 3.

The common form of cesspool is at its best a poor device, and a filthy one, bound sooner or later to fill up and become a nuisance. Much better than the common leeching cesspool is the combination leeching and water-tight cess-

pool, which allows the liquids to leech away into the surrounding soil while the heavy matter which is held in the cesspool may be cleaned out at proper intervals. If this combination form of cesspool is made of sufficient capacity to contain the sewage which accumulates during a period of from twenty-four to thirty-six hours, septic action will take

place in the tank, and the cesspool will then have advantages similar to those derived from the use of the septic tank.

In a great many instances, the one particular disadvantage of installing the septic tank, especially for residences, is the considerable cost that it represents. The septic cesspool should not ordinarily be beyond the means of a property owner to construct, and for this reason it is to be viewed with special interest. In its use no automatic sewage siphon is required; neither is a filter bed or sub-soil system of irrigation necessary. Wherever the ordinary leeching cesspool can work, there should be no difficulty in using the septic cesspool. It may be constructed of brick or stone, or of both, as in Fig. 3, its interior being lined with a coating of Portland cement, to make it water tight. The inlet pipe should turn downward, and end at a point some distance below the water level, in order that the inflow of sewage may not produce any commotion in the

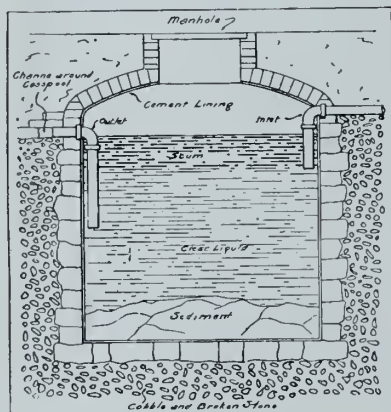


Fig. 3—Plan of Septic Cesspool.

liquid contents of the tank. The outlet should also turn downward to a point which will be below the top scum, and above the sediment at the bottom. It is in this part of the tank that the clearest liquid is to be found. Outside the cesspool broken stone or cobble stones should be filled in, and in this material a channel is formed entirely around the cesspool, as shown in Fig. 3. The outlet from the cesspool discharges the partially purified sewage into this channel, and the latter distributes it into the filling surrounding the cesspool, through which it filters into the surrounding soil.

An Objectionable Feature.

The only objectionable feature that we see in this manner of disposal is, that unless the channel is properly graded and constructed, most of the liquid will be deposited at or near the outlet of the discharge pipe, and other parts of the broken stone filling will have nothing to do.

It might be well to form this channel of narrow chestnut planking, with a slight pitch downward, and with small holes bored in it at intervals, for the escape of the liquid. It must be borne in mind that the liquid will for the most part enter the channel in small quantities. Another method that has sometimes been followed, is to provide four, six or more small overflows at intervals around the cesspool, so that the liquid may be deposited as evenly as possible into the broken stone. The only point against this method of overflowing is the fact that the several overflows must be set exactly on the same level if each one is to be depended upon to do the work which is expected of it.

Having now considered at considerable length the matter of sewage purification and disposal under conditions obtaining in the country, we come next to the subject of water supply, which is a matter of equal importance.

Country Water Supply.

In the first place, the essential features of a good water supply are freedom from disease germs, color, odor, taste and turbidity. In providing such found most acceptable, and deep wells essentials, springs will generally be next in desirability. It is well known found most acceptable, and deep wells that the source of supply most commonly in use in country districts is the shallow well, and this source of supply is often subject to very serious troubles. There is no objection to their use, of course, if it can be proved that the water provided by them answers the above requirements, but in the case of the shallow well, there is greater danger than in the case of deep wells or springs that the water in its course to the well has become polluted by taking up organic impurities or mineral salts which are objectionable.

The entrance of surface water into the well is another thing to guard against and as a preventative measure it is best to lay the upper part of the brick work, for a distance of about five feet, in Portland cement, to prevent the entrance of surface water without first purifying itself by filtration through the soil. The location of shallow wells near barnyards or privy vaults should not be countenanced, and the same thing may be said concerning the running of drains in the vicinity of the well.

When the drain must necessarily be run close to the well, it should be constructed of cast-iron pipe, with caulked lead joints. The ordinary earthen pipe with cement joints, can very rarely be depended upon to be tight at every joint.

Under no circumstances should slops of any description be thrown upon the ground in the vicinity of the well, and

the ground surrounding it should always be kept clean. The location of well as related to the location of barn, privy vault, cesspool, or other source of pollution should also be taken into consideration. For instance, the well should never be located at a lower elevation than one of these sources of pollution if there is any possibility of drainage taking place in the direction of the well. There is no need to go into details concerning the reason for these precautions and others that might be named, for the results coming from the pollution of drinking water supplies would seem to be very generally understood, far more thoroughly in fact than they were a few years back.

Pollution of Drinking Water.

It has always been the popular opinion that sanitary conditions in the country must of necessity be above re-

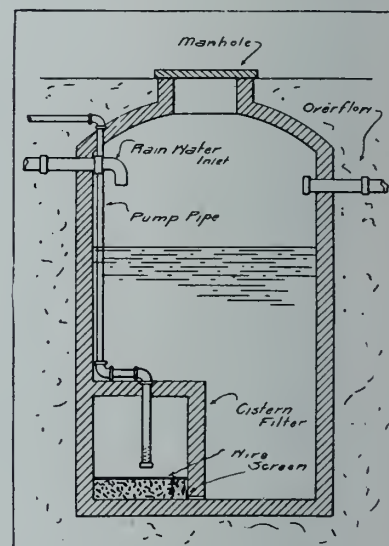


Fig. 4—Rain Water Cistern.

proach. This, however, is a false belief, and statistics will bear this statement out. The pollution of drinking water, with a consequent epidemic of typhoid fever for instance is by no means uncommon. It is a well-known fact that people visiting shore or country resorts in the vacation season, often return home with an attack of this disease, produced by nothing else than the pollution of drinking water.

With this brief consideration of the precautions necessary in selecting and maintaining a water supply, we will proceed to the consideration of certain features of the general subject with the particular object in view of showing and describing various important modern devices and applications.

The storage of water in many cases is a matter of importance. In some sections during certain periods of the year the only supply of water that can be relied upon is obtained by storing the rain

water which falls upon the roof of the house during rainstorms.

Rainwater Cisterns.

The natural supply of water in some sections is so hard that recourse must be had to stored rain water. Rain water is generally stored in underground cisterns located conveniently to the house. Rain water as it falls is the purest and softest form of water that can be obtained, but in its course to the cistern it necessarily gathers impurities which collect on the roof and in the gutters, and if the water is to be used for drinking purposes, it should be first filtered. The cistern should be constructed of hard brick, laid in Portland cement. The thickness of the walls and bottom should not be less than eight inches. The proper mixture in making the cement mortar is two parts of clean sharp sand, and one part of Portland cement.

The cistern should be provided with an overflow, and the inlet to the cistern should be supplied with a cut-off by means of which at the beginning of rainstorms the flow may be prevented from entering the cistern for a short time. This will prevent the entrance into the cistern of much refuse matter accumulating on the roof and in the gutters during the intervals between storms. Even with every precaution, however, more or less sediment and refuse will find its way into the cistern, making the filtration of such water a necessity, as before stated, if it is to be used for drinking purposes. The following is a very simple method of constructing such a filter. A section of the cistern is divided off from the remaining portion, by constructing a partition eight inches in thickness, resting on the bottom of the cistern, and reaching up slightly above the overflow. For about a foot up from the bottom, this partition should be laid with uncemented joints, and for the remaining distance it should be laid in cement and have a coating of cement. Through the loose jointed brick work the water will filter, and from this section it should be pumped, the rain water leader from the roof being connected into the main part of the cistern. In Fig. 4 is shown a cistern with inlet and overflow connections, provided with a filter which operates similarly to the one described above.

Construction of Filters.

The filter is made by dividing off a small section of the cistern by means of a brick box, into which the suction pipe is carried. The bottom is filled to a depth of ten or twelve inches with charcoal and gravel. A narrow passage should be provided at intervals at the bottom of the brick box, so that the cistern water may enter the filter, and these openings and the top of the filtering material should be protected by

means of wire cloth. Water will filter also through the brick work.

Another filter shown in Fig. 5 will also give excellent results. It is constructed of earthen drain pipe, six or eight inches in diameter, reaching to a point somewhat above the overflow.

The joints should be well made with Portland cement, and the bottom length firmly cemented to the bottom of the cistern. The pipe is filled alternately with coarse gravel or broken stone, and charcoal, and the pump pipe reaches directly down into it.

By extending the pipe above the overflow, any rigid connection between suction pipe and filter is avoided.

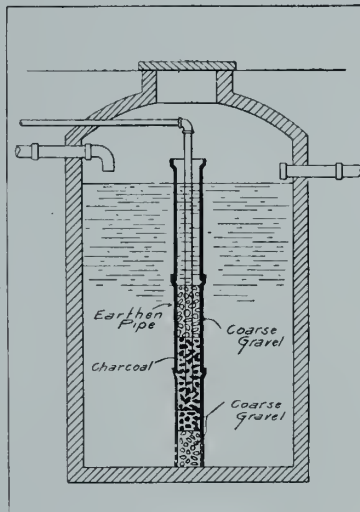


Fig. 5—Filter for Rain Water Cistern.

ELECTROLYTIC PURIFICATION OF SEWAGE.

The installation has just been completed at Santa Monica, Cal., of the first electric plant for the purification of sewage to be erected in the United States. The system is known as the Harris magneto-electrolytic process. It will be ready for operation just as soon as the necessary outfall pipes can be laid. The plant consists of two wooden tanks, each thirty feet long, two feet wide, and eighteen inches deep. Each tank is equipped with ten sets of electrodes and ten electro-magnets weighing three hundred pounds each. The electrodes are fitted with steam pipes for use in cleansing them. The electric energy is supplied by a direct-current generator of special construction, equipped with a motor and separate exciter. A generator of this pattern is required to obtain perfect results, as the requisite low voltage and high amperage, in opposition to the requirements for power and light.

The plant is located in a concrete chamber which is equipped with two compartments sealed tight, into which the sewage is pumped from the receiving basin. The purpose of these chambers is to secure an equalized flow

through the electric tanks, and their combined capacity is one million gallons per day. After leaving these sealed chambers, or forebays, the sewage is allowed to flow into the tanks in sufficient volume to cover the electrodes and the magnets to a depth of three inches. The current is turned on as the sewage flows steadily over the wires and enters the outfall pipe. By that time it is supposed to be odorless and perfectly harmless.

What actually happens as the sewage passes through these charged tanks has not been scientifically determined; but experience has demonstrated that as the electric energy required for the operation of the plant is held, the effect is to immediately release the hydrogen, and as it leaves the water the oxygen is released. The constituents of water being oxygen and hydrogen, the releasing of the latter precipitates all of the inorganic matter, and the releasing of the former forms an ozone, which is responsible for the burning or oxidation of the organic matter. The result is that the sewage becomes immediately purified, and if passed through sand or other filter appears as pure sparkling water.

Experiments have demonstrated that the cost of the electric energy required for the operation of the plant will not be in excess of fifty cents for each million gallons treated. The plant is being installed by C. P. Chandler and L. G. Lautzenheiser, who have contracted to operate it during a period of sixty days to the satisfaction of the city council. At the end of that test period, should the system prove to be a success, the city will purchase the plant, the approximate cost of which is \$12,000.

"IDEAL" POCKET CATALOGUE.

The "Ideal" line of plumbing supplies and gas appliances, made by the Ideal Manufacturing Company, Detroit and Windsor, is splendidly illustrated in a new pocket edition of catalogue "I," comprising 112 pages and cover, 5 x 7 inches in size. Nearly one-half the book is devoted to closet combinations, woodwork and valves, this being a special line manufactured at the company's plant at Windsor. A complete assortment of nickel-plated and rough brass fine thread fittings and tubing for waste fixtures, railings, etc., with the Ideal fine thread tool set, is also shown on about twenty pages. The Ideal centrifugal brass and lead traps for various fixtures and centrifugal cast iron running traps, cast iron drum traps, common nickel plated traps, bath cocks and wastes, lavatory stops, soil pipe and fittings have over 30 pages devoted to them, while a fine line of gas ranges, heaters and stoves are shown on the last dozen pages, full descriptive matter accompanying each illustration.

Summer Care of Heating Plants

Domestic Engineering Gives Some Practical Suggestions How Steam and Hot Water Fitters May Secure Additional Work and Greatly Benefit Their Patrons.

Few owners of low pressure steam or hot water heating plants know how properly to care for them during the summer months when they are out of commission. A heating plant will deteriorate more by lack of care during one summer's non-use than it will in several winter's active service.

Steam and hot water fitters could do a profitable business for themselves and a real service to the owners of steam and water heating plants, by systematically making every spring a canvass for the work of putting such plants into condition so as not to be harmed by the months of moisture and corroding rust through which they have to pass. Most of the plants are located in damp, low, illy-ventilated basements and cellars. Containing water of a temperature varying from the surrounding atmosphere they condense the moisture in the air upon the iron surfaces of sections and smoke pipes, and rust attacks the metal.

The sulphur which enters largely into the composition of anthracite, and still more into bituminous coal, is also largely present in the soot which collects in every part of the heater, smoke-pipe and chimney. When this soot becomes moist and pasty, as it does in summer, the result is the formation of sulphuric acid, which attacks and dissolves iron. A bath of sulphuric acid, in the proportion of one part acid to ten parts water, is used to clean iron articles which are to be tinned, as it effectually cleans all scale and rust. A cube of soft steel put into such a bath will in time disappear. A cube of cast iron will ultimately be dissolved if left in the same solution. This sulphurous, sooty paste attacks steel and cast iron heaters and will in time destroy them, pitting the steel and flaking off the cast iron. Hence it is very important that all soot be removed from the heater and smoke-pipe, and the surfaces made as clean as possible. All accessible surfaces should then be sprayed with crude oil or petroleum to prevent rust.

In order to lessen the passage of air currents through the heater, and thus diminish the deposit of moisture, the smoke-pipe should be taken down, thoroughly cleaned, and left down. The chimney should be thoroughly cleaned. The chimney hole, if left open, serves to assist in the ventilation of the cellar.

Water in Heating Plants.

As to the treatment of the water in heating plants authorities differ in details. If the plant is a new one and has been in use but one season, the water should be drained out and clean water substituted. Some authorities say that every spring, when the heater goes out of commission, the water should be drained off and fresh water be turned on and the system refilled for the summer and the water so turned on be left for the succeeding winter's use. There is a belief among fitters that water, once having been heated to the boiling point, and having cooled, is again heated to that point with greater rapidity; that some change has taken place in the water which allows it to absorb heat units more rapidly. Such fitters consequently believe that after the first season's use, and once washing out and refilling, the water should be left in permanently.

In our directions we advise draining off the water, but should these directions be reprinted they may be altered in that respect in accordance with the fitter's practice.

Dear Sir,—During the coming summer, after you have allowed the fire in your steam or hot water heater to go out, the heating system should be put into condition to withstand the attacks of moisture and rust. More deterioration will occur in one summer if this is not done than would be the case by several years' actual use.

We know just what to do to leave your heating plant so it will be just as good in the fall as it is now.

If you will do what we tell you to do, you can do it yourself. If you want us to do it for you, send us the enclosed postal card and we will send a man to do it for you. The cost will be inconsiderable.

We do all kinds of plumbing, steam and hot water heating, promptly, accurately and as reasonably as is consistent with good work. Very truly yours,

Enclose with each letter an addressed postal card reading something like this:

REDUCED FORM FOR ADDRESSED POSTAL

CROSS OFF THE PART YOU DO NOT NEED.

Either this	Please send a man on..... <small>(DATE)</small> and put my heating system in order for the summer.
Or this	Please send me your card of instructions as to "Summer Care of Heating Plants." Name..... Address.....

All ashes and clinkers should be removed from the grate-bars and ash-pit, which should be left swept clean.

The front and rear, and any exposed parts of the boiler should be painted with black paint, specially prepared for the purpose, called heat proof black enamel.

How to Get Business.

Have a quantity of letters printed sufficient to send one to every owner of a steam or water heating plant in your town whose name you can secure. The letter should read something like this:

To those who ask for the directions, have the card on the opposite page printed and mailed to them. Where you are sent to do the work, tack up a card in the cellar near the heater.

These letters should be prepared and ready to send when the climatic conditions are such that people are letting their fires go out for the season. In the latitude of Chicago it would be about May 15 to 20, and six days earlier or later may be allowed for each one hundred miles south or north. But the

thing to be accomplished is to have the letters delivered when they will be timely.

The results accomplished by such a campaign will be:

1. Much work, heretofore undone, will be added to your volume of business without increasing your fixed expense of doing business.

2. You will get this work at a time when it is needed, between hay and grass, as the farmer says.

3. You will do some clever advertising, the aptness of which will appeal to business men who receive the letters, the benefit of which will be seen in many unexpected ways.

4. You will be doing your customers a real service by preserving their property.

5. You will have access to a plant which, nearly invariably, is defective and run down, and upon which changes and repairs could be ordered if you pointed out their desirability or necessity. For example, pipe covering.

GAS LIGHTS FOR VENTILATING SEWERS.

Winnipeg for some time has been experimenting with sewer ventilation lamps in the shape of ordinary street lights as means of preventing sewer gas from becoming a public menace. The engineering staff of Winnipeg has had in charge the recent experiments with ventilation lamps, known as the Webb type, and as to efficiency, the report of both the city engineer and city bacteriologist appear favorable. City Engineer H. N. Rattan recently submitted to the Mayor and Board of Control, day to day reports covering 59 days' observation. In part, he says:

"When the lamps were working most effectively, the velocities in the sewers were only 4.22 and 3.60 ft. per minute, or supposing that the air came both sides of the lamps, as no doubt was the case, half the velocity, or 2.11 and 1.80 ft. per minute.

"In order to make this system of ventilation effective, I should think that lamps would be required, at least one on each 500 ft. of sewer.

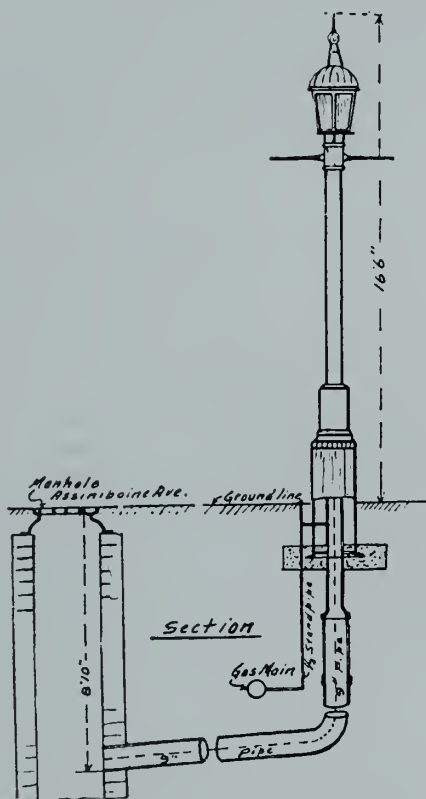
"There appears to be no doubt that the lamp effectively burns and disinfects what air goes through it.

"This being the case, the gas jet would be as effective if placed in the top of the manhole, allowing the products of combustion to escape at street level, and the cost, as compared with the lamp arrangement, would be trifling."

City Bacteriologist Dr. J. H. Leeming in his report to the Civic Health Committee says: "Plates containing culture-media of blood-serum, agar and gelatine were exposed to the sewer air both before and after it had passed

through the lamp. In the former case the plates were placed in the pipe leading from the manhole to the lamp. In the latter case the air was conveyed from the top of the lamp by means of previously sterilized iron pipe, 12 ft. in length. Six plates were exposed in both cases, and for a period of 1½ hr. I calculate that about 2,500 ft. of air passed over the plates.

"From the plates exposed to the air after passing through the lamp, I could not obtain a single growth of bacteria, thus proving that the air was sterile. From the plates exposed to the raw sewer air, before passing through the lamp, I obtained a growth of 302 germs.



Sewer Ventilating Public Gas Light.

I should judge as many more germs would be swept on before they had time to settle on the plates.

"No one now disputes that sewer air contains micro-organisms. The unsettled point is whether under all conditions sewage will impart to the air its contained micro-organisms. It has been practically definitely proved that, when there is a formation of bubbles in the sewage, the germs, amongst them, of course, are pathogenic ones. It seems evident to myself that the lamps fulfill admirably the purposes for which they are intended, viz., the prevention of all nuisances arising from sewer manholes."

The Bank of Montreal have purchased the Lyman Rodgers property at Sawyerville, Que., where they intend shortly to build a branch.

A REST FOR THE EYE.

The Canada Metal Co., Toronto, is supplying its customers with a neat lamp shade for electric desk or hanging lamps. The frame is made of stiff cardboard and the sides are filled with transparent paper, which, while it sheds the light on the desk and work below, takes the full glare of the electric light itself from the eyes of the reader or worker and acts as a rest to the eye. The transparent sides are used, too, to enumerate the wares carried by the company—metals and their products.

WHERE SPRINKLERS ARE NECESSARY.

It is now universally recognized that no material is so thoroughly fireproof as reinforced concrete. Steel construction, although not itself inflammable, is of all materials most disastrously affected by heat. In fact the supporting members of such a building with their thin webs and flanges could hardly be designed to be more readily susceptible to the effect of heat whereby their strength is suddenly and greatly decreased. Even steel protected with wood is better than the naked steel, but reinforced concrete with all steel enclosed is resistant to any fire if the protection be of sufficient thickness.

In a recent discussion, Leonard C. Wason, president of the Aberthaw Construction Company, Boston, Mass., pointed to the fact that even though the building itself may be absolutely fireproof and hence that sprinklers may appear unnecessary, its contents may be so much more valuable as to make it poor business policy to omit them. The total cost of initial installation of a complete sprinkler service is roughly four cents per square foot of floor. Mr. Wason referred to the recent Deering-Cousens fire in Portland, Maine, where the contents were worth fully ten times the cost of building, and showed that to use sprinklers and extinguish the fire before the contents were entirely consumed would under such circumstances show a vastly greater saving than to omit them and lose the contents of even a single room in a building so fire resisting as to prevent its spread. Of course, in mill construction, such relations between cost of building and contents seldom exist except possibly in storehouses. Hence the more general use of the unsprinkled reinforced concrete building. But as Mr. Wason further showed, the merit of reinforced concrete is not alone in its fireproof qualities. It has in addition a degree of permanence possessed by no other type of construction which warrants its general use.

Evolution of Steam Warming

R. T. Crane, in the Valve World, Gives Some Ancient History and Describes the Early Warming of Public Schools.

When we entered the business of steam-warming, practically all the schools in this country were warmed by hot air furnaces or stoves. As everyone knows who is familiar with the business, it is exceedingly difficult to warm any large building throughout with any regularity by a furnace, as the wind has a most decided effect in the way of forcing the heat from one side of the building to the other, so that the warming is decidedly unsatisfactory.

Of course all managers of school buildings were looking for something that would do this work in a better manner, and when steam came into prominence, they very naturally looked to steam as probably being the most satisfactory substitute for furnaces and stoves.

About the time we started in business Baker & Smith, New York, put a steam heating apparatus in a building in Chicago. This system was wholly direct warming, and to prevent one coil from backing up into another, and to enable the occupant of each room to regulate the heat, check valves were put in the return pipes, which, as previously explained, proved to be very unsatisfactory.

Soon after this it was suggested that instead of using check valves the return pipe from each coil be brought down to a water seal below the water line of the boiler.

First Steam Systems in Schools.

About the year 1863 we were awarded the contract for warming two school buildings in Chicago in which we introduced the above-mentioned system, that is, bringing the return pipes down to a water seal below the water line in the boiler; and the result was a highly successful job in every particular. The buildings were thoroughly warmed and the boiler was automatic as to draft regulating and water feed, so that the janitor could run it with very little attention. I think these were the first satisfactory jobs of steam-warming ever put in public schools.

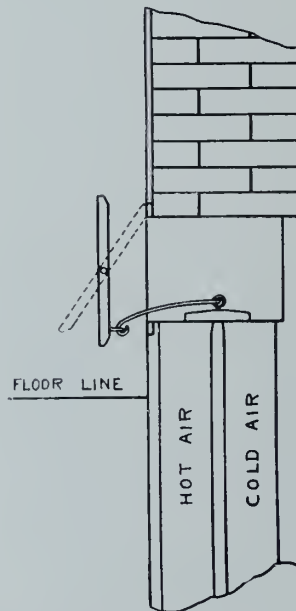
After this the city put in a number of other jobs of steam-warming in the public schools; in fact, practically adopting this system as the standard way of warming the schools.

This apparatus was in every way a perfect and beautiful one; but it had the serious drawback of not affording ventilation. Upon studying this subject more fully, I became convinced that it was time the city took up a system of warming that would give ventilation,

and took the matter up with the building committee of the board of education, with the result that the board adopted a system of all-indirect warming, the air being forced through the building by a fan. We were unsuccessful in getting this first contract, although we were entitled to the credit for persisting in having the board take a step in that direction.

Early Troubles With Ventilation.

The result of this first job was that notwithstanding the contractor who put it in made great claims for having pro-



Register and Means of Regulating Air.

duced a perfectly ventilated building, I found on visiting this school on a raw, muggy morning, with an officer of the city, that on opening the door of the schoolroom a stench came out that was enough to knock one down. Needless to say, this spoke very badly for a system that the committee and contractor had claimed was giving a perfectly ventilated schoolroom.

The fact is, the room was probably worse ventilated than it would have been under any other condition, because the teacher probably would not pay as much attention to ventilating it from the windows as she might have done if such claims had not been made for the apparatus.

This condition of things naturally made a strong impression on me as to the necessity of something radically dif-

ferent in the way of ventilating a building, and came to the conclusion that what was wanted was an apparatus in which the ventilation was separated from the warming; that is to say, an arrangement by which the ventilation was continuous and the air warmed as required by the weather.

I then devised a system of flues and a register, by which means the air would go through a coil to a greater or less extent as required to warm the rooms, and over the coil when not requiring so much warming, or partially each way. It is needless to say that such a device was what was absolutely required, and that it did answer the purpose perfectly. And I may add, without fear of contradiction, that I was the first and only person who ever produced a perfect ventilating and warming apparatus.

The invention referred to was made and patented by me in 1869, and the first one put in was in the Washington school, Chicago, in 1871.

DECORATING THE BATHROOM.

The plaster walls of a bathroom should be painted with oil paints on account of the possibility of their surface getting splashed with water from the fixtures, and for the advantage of being able to wash the walls when required.

The rooms where the walls show dirt should be thoroughly brushed with a broom, and if this does not clean them they should then be washed with a solution of soda water. This solution should, however, be washed off with clean water before it has had an opportunity to thoroughly dry. After the washing of the walls it is well to let them dry for at least twelve hours. When dry give them a thin coat of fresh slacked lime with a fairly good amount of alum mixed with it. The alum to work properly should be dissolved in hot water. Before applying the size coating, care should be taken not to allow it to come into contact with the lime wash until the lime wash is thoroughly dry, as the lime will immediately destroy the strength of the size. The size coating should be made of whiting and of a good glue size. If there are stains which are impossible to take out, a thin shellac varnish may be applied previous to putting on the finishing coats of paint.

The walls which for the first time are to receive their paint should have, for the first coat, boiled oil, or a coat of drying paint, and then a thin coat of size. This will prevent the showing of any sponge spots that there might be in the wall. After this, one coat of paint may be applied, and then when this coat is dry we can apply our finishing coat.

The constant demand of architects and other experts for white lead and linseed oil can be better understood when we are familiar with the materials. Paint is a mixture of solid particles and a liquid. The first is technically known as the

pigment and the other as a vehicle. This mixture when spread in thin layers upon surfaces dries solid and protects the face of that to which it is applied. There are several liquids which from frequent tests answer the requirements of a perfect vehicle—namely, poppy oil and linseed oil. The expense of poppy oil makes its use out of the question. The other essential ingredient is a pigment, the solid part; and here nature provides a practical material, white lead. Pigments which, when used by themselves, cannot even be made to behave like paint, can, with the addition of white lead, be made in a general way to resemble white lead, but cannot be made to wear permanently.

The bathroom window or door should not be glazed with the ordinary glass but have a glass of translucent nature, ground, sandblasted, stained or any of the rough or pattern molded sheet glasses are desirable. The sill of the bathroom window should be at least thirty-six inches above the floor level, and be

so placed as to properly light every portion of the room. This room in particular should be well ventilated. The window should also be placed so that one does not have to stretch across any of the fixtures to close it.

The door should have a separate bolt, or have a lock with a bolt attachment. Holes about one inch in diameter bored through the lower rail of the door at four or five inches on centres improves the ventilation of the bathroom or toilet room. This method has been very successful where ventilation has been retarded, and may be used where the toilet or bathroom window enters into an enclosed air shaft. These holes can be bored on an angle of about 45 degrees through the door, the highest point being on the exterior of the door, so that the holes have a downward pitch toward the interior of the toilet or bathroom. By boring them in this manner it is impossible to see any but the small portion of the floor directly adjoining the door.

Heating an Office with a Gas Water Heater

Frequently the heating contractor is called upon to warm a room or an office located where there are no provisions for the use of a heater either in the way of a chimney or other heating apparatus from which heat might be derived. Under such conditions the heating apparatus used by the Beler Water Heater Company, 627 Second Avenue, Pittsburgh, for heating its office is interesting as offering a solution of such a problem. The building occupied by the company, according to the Metal Worker, has the entire first floor used for shop and storage purposes, and with the brazing forges and other forges in the shop, all the heat is afforded that is required for the workmen. The chimney at the extreme back of the building is only used for carrying away the products of combustion from the fires and affords ventilation.

Office on Storage Floor.

The floor immediately above is entirely used for storage purposes, so that the office which occupies a space of 25 ft. across the front with three large windows in it and extends back on one side 15 ft. may be said to have six cold sides, the top and two of the side walls being exposed to outside weather conditions, while the bottom and two other sides are exposed to indoor space which is not heated. The necessity for heat in the office led to the use of one of the company's water heaters to circulate the heated water through a radiator exposing 85 sq. ft. of surface, located as shown in accompanying diagram. The method of connecting the piping is shown in the elevation. Here

it will be noted that the small heater is supported on a bracket on the side wall on the lower floor vestibule. A small pipe is run to outdoors to dispose of the products of combustion. The heater contains 21 linear feet of $\frac{3}{4}$ -in. copper coil, and exposes about 4 sq. ft. of heating surface. This is connected by means of 1-in. piping, with the radiator located in front of one of the windows on the floor above and an expansion tank is connected to the pipe by means of a $\frac{1}{2}$ -in. pipe.

Cost Only \$10 for Winter.

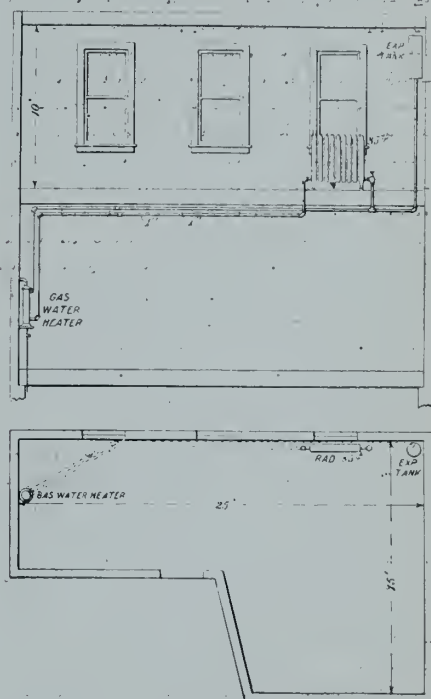
During the past winter a temperature as low as 7 degrees out of doors was experienced in Pittsburgh, at which time there was no difficulty in maintaining a temperature above 75 degrees in the office. The gas used for fuel was natural gas, containing between 1,000 and 1,200 heat units per cubic foot. The burner in the water heater was controlled so that the largest amount of gas that could be consumed per day, with natural gas at 30 cents per thousand, would amount to a cost of only 15 cents. No such expense, it is stated, was incurred, however, owing to the fact that after the heater had been run for a short time and the hot water began to circulate, the consumption of gas was cut down by turning off the supply cock partially, so that the gas consumed cost less per month than if the heating had been done with coal. In fact, it is claimed by the company that the expense of heating the office for the entire winter was less than \$10.

The diagram shows that the space heated is about 2,800 cu. ft. As the

ceiling of the room is 10 ft. above the floor and assuming the floor and roof exposure to be one-twentieth of that of glass and the inside partitions one-eighth that of glass and the exposed wall one-fourth that of glass, gives with the actual glass a total equivalent glass surface taken care of by the little heater of 228 sq. ft. By dividing this by the 85 sq. ft. of surface in the radiator a proportion of 1 sq. ft. of radiating surface is provided for 2.7 sq. ft. of equivalent glass surface. By dividing 2,800 by 85 a proportion of 1 sq. ft. to 33 cu. ft. of space is found.

May Solve Other Problems.

This is sufficient to show those who may have a similar heating problem to



Plan of Office and Heating Apparatus.

contend with that the solution may be found in a little gas water heater which may be turned down low when the office is not in use and economize in running cost and yet maintain a temperature which can be readily raised by turning the burner on full when the office is to be occupied for its regular work. It is further interesting, however, to see how this working example bears out the engineering theories on the subject. With gas at 30 cents per 1,000 cu. ft., the use of 15 cents' worth per day shows that but 500 cu. ft. were used. Assuming 1,000 heat units per cubic foot for the gas, there would be available 500,000 heat units per day of 24 hours. Assuming an efficiency that would utilize 80 per cent. of the heat there would be 400,000 heat units used in heating the office. As the heat is lost through the floor, ceiling, walls and glass, the

228 sq. ft. of equivalent glass surface must be reckoned with. With an outside temperature of zero and an inside temperature of 70 there are 85 heat units transmitted per square foot of glass per hour. Multiplying 228 by 85 shows a total loss per hour of 19,380 heat units, and dividing the 400,000 by 19,380 shows that the gas is sufficient to supply the heat for 20 hours. However, the heat is never used for so many hours, and the surplus is lost in heating the air that gets into the office through leakage around the windows and through the walls.

Estimated Heat Transmission.

On a cold day the water in the system with the heater run hard could probably be readily heated to a much higher temperature than in the ordinary apparatus. The copper coil is an excellent conductor, and the water might easily reach a temperature of 200 degrees or more in the radiator. With the radiator at 200 and the room at 70 there would be difference in temperature of 130 degrees. Allowing a heat transmission from the surface of 1.6 heat units for each degree difference in temperature and multiplying 1.6 by 130 an emission 208 units per square foot is found. With the temperature outside at 7 and inside at 70 and a difference of temperature of 63 degrees, the heat transmission of the glass would be something less than the 85 heat units transmitted when the difference is 70 degrees. But if the 2.75 sq. ft. of equivalent glass surface which 1 sq. ft. of radiator surface must provide for, is multiplied by the usual 85, it will be found 233 heat units are necessary, which is more than the previous calculation has shown the apparatus will provide.

This seeming shortage, however, may be easily supplied either by heating the water to a higher temperature or it may be unnecessary when daylight brings the sun with its powerful effect. It would be a simple matter to count the surface exposed in the piping and the expansion tank to supply the seeming shortage. However, the apparatus has done satisfactory service, so there has been no shortage. There is another point that can be followed with interest, and that is the fuel bill. In a heating season of 200 days at 15 cents per day the total should be \$30, but it was only \$10. Does this mean that the fuel required for 200 days on a zero basis with any kind of fuel can be always divided by three to get at the actual amount required when due allowance is made for fall and spring weather?

Montreal's building permits for June numbered 127, valued at \$416,080, as against 184, valued at \$864,266 for the same month last year.

YOUTHFUL PLUMBERS.

Friends of Harry Mahoney, Guelph, may not recognize him in the accompanying picture. The sitting position as boss of the job may look natural to the acquaintances of the treasurer of the National Master Plumbers' Association, but the long curly locks do not carry out the resemblance between Harry the first and Harry the second. Richard, junior, is busy at work on the floor under the sink, and Harry thinks this is just where he ought to be.

That Harry the first is long headed is illustrated by a story of the early days of his business career at Guelph. He had been touring the continent as a journeyman and in his wanderings around the big cities across the line he had picked up a few ideas. So when he and his brother "Dick" decided that the



MAHONEY BROTHERS, GUELPH,

The Second Generation of a Popular Firm of Guelph Plumbers.

people of Guelph needed their assistance in keeping their bodies and homes in a sanitary condition, Dick got busy with the tools and Harry, in addition to doing his share of the work, got busy on enlightening Guelph with gas mantles (at \$5 per light) in his spare time in the evenings. The first year he cleaned up about \$500 after hours, the Welsbach lights being then a novelty even in Toronto and Montreal. After demonstrating their utility he retained a monopoly of the supply of mantles and shades for two or three years.

Mahoney Brothers, the plumbing firm, are both enterprising and successful. Harry, as an alderman and persistent worker in the Master Plumbers' Association, and Richard as a steady worker, and, after hours, a lawn bowler, are two of Guelph's best citizens.

Mahoney Brothers, shown in the ac-

companying illustration, are the children of "Dick" and the idols of Harry, who hopes some day to see them active participants in provincial and national conventions of the M.P.A.

Guelph is having an "Old Home Week," August 2 to 6, and the photo shown was taken for an illustration in the official programme for that event.

TORONTO ASSOCIATION'S NEW OFFICERS.

The Toronto Master Plumbers' Association has completed its work of reorganization and will meet on Tuesday evening, July 21, at the Temple Building, to arrange details regarding the work to be undertaken during the coming winter. Both social and educational features are being planned and between entertainments and trade discussions the men in the trade are certain to enjoy a profitable and pleasant winter. The membership begins with about two score of the best known firms in Toronto, and should rapidly increase.

The officers elected were:

President—J. W. McKittrick, (Toronto Furnace & Crematory Co.).

Vice-President—Alex. Purdy (Purdy-Mansell Co.).

Secretary—George H. Cooper.

Treasurer—George J. McGuire, W. J. McGuire Plumbing Co.

Executive—The officers, and George Clapperton (Bennett & Wright Co.); Legrow and Robert Yeomans.

Arrangements are being made to send a delegation down to the national convention at Montreal in August and continue in affiliation with the National Association. It is also hoped to arrange to hold the national convention at Toronto in 1909.

TOLEDO MALLEABLE VISE.

A malleable vise of remarkably interesting accomplishments has been developed by the Toledo Pipe Threading Machine Company, Toledo, Ohio. Possible applications are the holding of pipe as small as $\frac{1}{8}$ -in. in diameter, and the holding of a $1\frac{1}{2}$ -in. elbow. One of its features is that the yoke holding the upper jaw does not drop off the screw, so that the screw threads are not likely to strip nor the device otherwise get out of order. By means of the unique mechanism of the yoke allowing the upper jaws to take the positions shown in its application to the elbow, the vise is regarded as capable of gripping an endless variety of material within its capacity without regard to shape. The lower jaws are a part of the base casting. The gripping surfaces of the vise are $1\frac{3}{4}$ inches wide. It is stated that it can be used with brass and nickel plated pipe without marring, or in other words, that it has the velvety yet positive grip of a Stillson wrench.

NEWS OF THE TRADE IN CANADA

Omer Julien, plumber, Fraserville, Que., died recently.

Porter & Broad, gas and electric fixtures, Hamilton, have assigned.

Germain & Co., plumbers, St. Romauld, Que., have been registered.

Van Alstyne & Hills, gas and electric supplies, Hamilton, have dissolved.

A. Allison has succeeded Torpy & Allison, 250 St. Patrick Street, Toronto.

W. Grant, master plumber, Sudbury, has moved into a large new store building.

A renewed effort is being made to reorganize the Mann Brass Works, London.

George H. Ling, master plumber, Toronto, has moved from 627 Queen Street West, to 124 Arthur Street.

Taylor & Read, Toronto, have the plumbing contract for the Toronto Electric Light Co.'s new sub-station.

The Monarch Brass Co., Toronto and Port Colborne, have issued a new catalogue describing their brass goods.

Anderson & Sime, Fort William, have the plumbing contract for the new wing of the McKellar general hospital there.

John McKay, Chatham, has secured contract for installing new heating system in St. Andrews Church at Chatham.

W. J. McGuire, Toronto, has the plumbing, heating and wiring contracts for the new \$20,000 Gooderham residence.

Archibald Bros., who conduct a plumbing establishment in New Westminster, had a close call from fire recently.

John Mathis and C. W. Purcell have formed a partnership in Sterling, Ont., under the name of the Sterling Plumbing & Heating Company.

The heating and ventilating contract for the new High School at Oakville, Ont., has been awarded to the Fred Armstrong Company, Toronto.

The Garth Co., Montreal, has been awarded the contract for heating and ventilating the Collegiate Institute at Ottawa, the price being \$18,045.

Hunt & Nicholson, now the Western Plumbing & Heating Co., Lethbridge, Alta., have the heating and plumbing contract for the new Knox Church there.

The James Smart Manufacturing Company, Brockville, has been awarded the contracts for heating and ventilating the two schools recently constructed there.

George Henders, who until his retirement two years ago, was a merchant on St. Lawrence Street, Montreal, dealing in plumbers' supplies, is dead at the age of 76.

Mike Buller, a plumber, while diving at Port Stanley, touched the bottom and nearly broke his neck. He was removed

to St. Joseph's Hospital, London, where his condition is critical.

A number of plumbers are at present engaged in putting in an up-to-date plumbing system in the new drill shed being erected at Belleville. George Johnston has the contract.

The Chatham School Board has awarded to Westman Bros., contract for steam heating the new collegiate institute. A tubular boiler will be installed and Gurney radiators will be used.

The following contracts have been let to G. G. Taylor, Saskatoon: Plumbing of houses for J. Holmes and R. B. McLeod; plumbing and hot water heating of houses for C. S. Maharg and Judge McLong.

The Gurney Tilden Co., Hamilton, have arranged with the American Radiator Co. to have three new types of boilers manufactured for them at the American Radiator Co.'s Canadian plant at Brantford.

The American Society of Heating and Ventilating Engineers' semi-annual meeting will be held at Niagara Falls, N.Y., on Friday and Saturday, July 24 and 25. About a dozen Canadians are expected to attend.

The remodelled public comfort station at the corner of Toronto and Adelaide Streets, Toronto, was opened for use on Monday, July 13. The heating is done by means of a gas heater and a couple of wall radiators.

Adam Clark & Company, plumbers, Hamilton, have secured the contracts for installing the plumbing and heating systems in the Pieton and Sophia Street Schools. The total of the two contracts will amount to about \$1,400.

Park Bros., Chatham, have secured contract for installing the new tubular boiler and steam mains in the Central School at that place, it having been decided to discontinue the contract for steam from the Central Heating plant. The contract amounts to \$2,600.

The Canadian Fairbanks Company have obtained the contract for the supply of valves for the sewage disposal works at Hamilton at \$78.67 each. The contract for spraying nozzles was awarded to J. Wallace & Sons at \$2.18 each.

Wainwright and Morrison, Sudbury, report trade satisfactory in their growing town. Last year all householders were ordered to install sanitary conveniences and this work has kept all the four plumbing firms busy. Many new buildings are also being erected.

T. J. Carling, of Montreal, has been appointed agent for the General Brass Works, Toronto, in the Province of Quebec and the City of Ottawa. He also

has been appointed agent for the Em-deca Embossed Metal Decoration Co., of Austria.

While at work in a new building at the corner of Gain and Lafontaine Streets, Montreal, George Turgeon, a steamfitter, 43 years of age, dropped dead. Turgeon complained to his fellow-workmen of a sudden pain in the heart, and before medical assistance could be summoned he fell over dead.

A special car containing the Chicago delegates to the convention of the U. S. National Master Plumbers' Association at Boston on July 15, 16 and 17, arrived at Toronto on Saturday morning, July 11. The Chicago plumbers spent the day in Toronto and passed through Montreal Sunday evening, remaining only a couple of hours in the Royal City.

The new court house at Saskatoon has just been completed. The plumbing contract was done by the Western Heating & Plumbing Company. The building is equipped with seven closets, seven lavatories, and bath, urinal, kitchen, sink and range boiler. There is also a drinking fountain in each of the halls and a couple of massive wrought iron lamps adorn the entrance. The building is steam heated.

The Plumbers' Union, of Winnipeg, has made an appeal to all trades organizations of the Dominion for financial aid to enable it to appeal to the higher courts against the judgment recently rendered in the case of the master plumbers against the union. In this case the union was fined \$2,000 for persuading non-union men to quit work, or not to go to work during the last strike of that body. The Trades and Labor Council has voted \$500 to start the fund.

Victoria has been awarding contracts for rivetted steel pipe to a Seattle firm, and another American house got the contract for supplying additional fire apparatus. The pipe required will be a large amount of different sizes, and the Hydraulic Supply Company, of Seattle, was awarded the contract at the following prices: 27 in., \$2.83½; 24 in., \$2.48¾; 18 in., \$1.93; December delivery. Wrought iron specials, 15c per pound. The contract for specials was also awarded to this firm, Messrs. Adams & Parsons, Victoria, getting the contract to supply cast iron specials at 7½c per pound. The Robertson Iron Works will lay the pipe.

The value of building permits issued in Vancouver during June totalled \$330,900, a little less than last year. The total for the half year ending the 30th ult., however, showed an increase of \$1,183,535, as compared with last year.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

A \$2,500 school will be built at Picton, Ont.

A \$200,000 high school is proposed for Everett, B.C.

A new \$35,000 school building will be built at Sudbury.

A \$54,000 school building will be erected in Victoria, B.C.

Plans have been prepared for a \$10,000 school at Morris, Man.

Ingersoll, Ont., is considering a by-law to raise \$16,000 for school purposes.

Contracts have been awarded for a new Presbyterian Church at Brownsburg, Que.

Laval University, Montreal, will convert the Hospice St. Joseph into a public library.

The Six Nations Indians on the reservation near Brantford will erect a \$5,000 hospital.

A site has been selected by Calgary for the \$50,000 drill hall to be erected this year.

Alterations to cost \$22,000 will be made to Wellesley St. Public School, Toronto.

A new Presbyterian Church is to be erected at New Edinburgh, Ont., this season.

A steam heating plant will be installed in the Vermilion, (Alta.) Centre school.

A new Shea's Theatre, to cost about \$150,000, will be erected in Toronto this summer.

An addition to the city power station will be built at Calgary to house the new machinery.

The Smith's Falls Council will issue \$6,000 debentures for repairs to the high school.

An \$80,000 sanitarium will be erected at Tranquille, B.C., for the Provincial Government.

A new heating system will be installed in the Ontario Institute for the Blind, Brantford.

The Niagara Falls Public School Board have asked for \$8,000 more for the building of schools.

The Fort William School Board has been granted \$69,000 for the erection of a new eight-room school.

Carl Berch, Vancouver, will erect a \$90,000 theatre building at Edmonton for Vancouver capitalists.

Andrew Carnegie has made an additional grant of \$39,000 for an extension to the Winnipeg Public Library.

A new school is being built at Gould, Que. It is to cost some \$4,000, and is being erected by D. H. Morrison.

F. L. Dixon, Sydney, has been awarded the contract for the new Presbyterian Church at Inverness, N.S.

P. Lyall & Son, Montreal, have the contract for the Legislative Buildings at Regina, the price being \$1,424,150.

The Alberta Sanitarium, at Edmonton, will be moved to Strathcona, and a new \$35,000 building will be erected.

The Peterboro armories are now ready for the roof to go on and tenders are being invited for the heating system.

The British Columbia Government proposes erecting a hospital for the insane at Coquitlam, near New Westminster.

A by-law has been passed providing for the expenditure of \$25,000 for the erection of a town hall at Rosthern, Sask.

The plans prepared by Stanley Mitton have been accepted for additions to the Grandview and McDonald Schools, Vancouver.

The plans prepared by Thornton Sharp, Vancouver, have been accepted for the new west side school, New Westminster.

A by-law will be submitted to the Prince Albert ratepayers authorizing the expenditure of \$25,000 for a new market building.

S. S. Cooper, Clinton, has been awarded the contract for the erection of the new Presbyterian Church at Brucefield, Ont.

The contract for the Arcola, Sask., courthouse has been awarded to Thos. Grayson, Moosomin, the contract price being \$27,045.

The congregation of Holy Trinity Church, Fairview, B.C., will either extend their present building or erect a new edifice.

Hon. W. H. Cushing, Minister of Public Works, Alberta, states that both a jail building and courthouse will be erected at Lethbridge this year.

The Public Works Department has awarded to Robert Cameron, Almonte, the contract for the erection of a public building at Magog, Que., to cost \$20,000.

W. Lachance & Son have been awarded the contract for the erection

of a two-storey presbytery for the Roman Catholic congregation at Fraserville, Que.

The plans prepared by W. W. Blair, Winnipeg, have been accepted for the new high school building at Minnedosa, Man., to cost \$20,000.

The congregation of Eglinton, Ont., Methodist Church, is contemplating enlarging their church and Sunday School room to cost \$10,000.

Contracts have been awarded for the erection of the St. Sauveur Orphanage for the Grey Nuns at Quebec. The building will cost \$46,000.

At the last meeting of the Saskatoon city council, the contract for building a new fire hall was let to G. A. Marr. The hall will cost \$14,100.

The Hamilton Separate School Board has appointed a committee to proceed with the erection of St. Ann's School, estimated to cost \$8,000.

A by-law will be submitted to the ratepayers of Port Arthur authorizing the expenditure of \$175,000 for a new municipal building and opera house.

The German Lutheran congregation, Montreal, has awarded to J. E. Moore the contract for the erection of their new church, to cost \$21,000.

Architect J. H. G. Russell, Winnipeg, has prepared plans for a church building to be erected at Roblin, Man., for the Presbyterian congregation.

The Winnipeg School Board has awarded to John Saul the contract for an addition to the Malvey St. School, to cost approximately \$56,000.

Plans have been prepared for the new church building to be erected for the congregation of St. Matthew's Church, Winnipeg, to cost about \$25,000.

T. J. Brocklebank, Brandon, Man., has been awarded the contract for the erection of a school building at Craik, Sask. The structure will cost \$19,000.

The Alberta Public Works Department, Edmonton, has purchased two lots in Strathcona for the erection of a local telephone exchange building at a cost of \$10,000.

The contract for the new twelve roomed Cecil Rhodes school in Weston (Winnipeg) has been awarded to Davidson Bros. at a cost of \$64,781, which does not include heating and ventilation.

The governors of Acadia College, Wolfville, N.S., have awarded the contract for the Carnegie Science Building to Rhodes, Curry & Co., of Amherst. Construction work has commenced.

The Halifax Board of School Commissioners are contemplating the erection of two modern schoolhouses. Ten-

ders were opened for one a week ago. The lowest tender was \$125,000, but as this figure was considered too high, new tenders will be asked for.

General Building Notes.

J. W. Gale, Toronto, will erect a \$9,000 residence.

The Country Club, Ottawa, is building a new club building.

H. A. Mullins, Winnipeg, will erect a large apartment block.

C. G. Eadie, Montreal, will erect a residence to cost \$10,000.

Alfred Johnston, Toronto, will build a dwelling, to cost \$13,000.

Dr. Harvey Vaux, Toronto, will erect a residence to cost \$10,000.

John Hayman will build a \$50,000 apartment house at London.

The Tyrrell Block, Chatham, Ont., is to be completely remodeled.

St. Thomas' building permits for June were valued at \$34,000.

Dr. Geo. E. Cook, Toronto, will erect a dwelling, to cost \$13,000.

James Curry will build ten residences in Toronto, to cost \$20,000.

The building trade is reported to be very active at Prince Rupert, B.C.

Building permits in Toronto for the week ending July 4 totalled \$117,300.

About 800 buildings are being erected in Winnipeg at the present time.

The Canadian Bank of Commerce will erect a \$30,000 building at Strathcona, Alta.

The Atlantic Hotel, North Bay, will be enlarged by an additional three storeys.

Davidson Bros., Winnipeg, have the contract for the erection of a \$15,000 residence.

An appropriation of \$34,000 has been made for an Inland Titles Office at Saskatoon.

Architect J. N. Cowan, Toronto, has prepared plans for a club building, to cost \$15,000.

La Fabrique de St. Charles, Montreal, has been granted a permit for a \$25,000 residence.

The Princess Hall Company, Montreal, has been granted a permit for a hall, to cost \$20,000.

H. B. Aylesworth has prepared plans for the erection of a large apartment building at Vancouver.

E. F. Head, Sudbury, has prepared plans for two dwellings for Mrs. (Dr.) Irwin, to cost \$12,000.

L. Jorundson, Winnipeg, has been granted a permit for an apartment block, to cost \$56,000.

Jess Applegath will expend \$20,000 on G. H. Featherstone's store, Montreal, recently purchased by him.

Plans for a \$60,000 apartment block, to be erected at Winnipeg, have been prepared by V. W. Horwood.

Bridgewater, N.S., is enjoying a building boom, no less than 29 structures being under construction.

Oakes & Everard, Medicine Hat, have been awarded the contract for a \$20,000 store building for James Mitchell.

The Bank of Nova Scotia, Toronto, has been granted a permit for a four-storey bank building, to cost \$50,000.

J. L. McTaggart has been granted a permit for a frame store and rooming house at Vancouver, to cost \$18,000.

Geo. H. Walton has been granted a permit for an apartment block at Winnipeg, to cost approximately \$100,000.

J. J. Dissette has the contract for the \$45,000 business block to be erected at Vancouver for H. D. Wright, Seattle.

Architect G. Bird, Toronto, has prepared plans for a \$500,000 bank building for the Bank of Toronto at that city.

A permit has been issued to W. T. McMullin for a three-storey brick business block at Vancouver, to cost \$20,000.

The National Construction Company has been awarded the contract for the erection of a \$380,000 building in Vancouver.

Dalton & Eveleigh, Vancouver, will prepare plans for an hotel at North Arm, for the Indian River Park Company.

Chas. Mills, Hamilton, has taken out a permit for an office and apartment building for Thomas Crooks to cost \$30,000.

The Locomotive Engineers Company, St. Thomas, have purchased a site on which they will erect a three-storey building.

The Hamilton, Ont., North End Improvement Society has appointed a committee to secure a site for the erection of a new hall.

In addition to a number of stores and new bank building there are twenty-five residences under construction in Moncton, N.B.

The Northern Bank has purchased property in Red Deer, Alta., with a view to the ultimate erection of a new business block.

Waterworks and Sewerage.

Magog's (Que.) new waterworks system is rapidly nearing completion.

Hipple & Shannon have the contract for the Forsyth St. sewer, Sarnia.

Regina is looking for authority to spend \$50,000 for waterworks extensions.

West Toronto is considering a proposition of the Artesian Water Co. to supply that city with water.

North Toronto will submit plans and estimates to the council for a filtration bed for the waterworks station.

Fort William will on August 5 vote on a by-law to raise \$95,000 to extend the Loch Lomond waterworks.

Arcola, Sask., ratepayers have again passed the by-law to complete the construction of that town's waterworks scheme.

The St. Louis, Que., council will submit a by-law to the ratepayers for the purpose of laying water pipes to cost \$180,000.

Dobson & Jackson, Vancouver, have obtained a contract for sewer construction on May and Nairn Streets, Elmwood, B.C.

The concrete Engineering & Construction Co. have obtained the contract for section "C" of Preston's, Ont., sewerage system.

A by-law will be submitted to the ratepayers of Richmond, Ont., authorizing the expenditure of the sum of \$20,000. for sewers, etc.

Hintonburg, Ont., is now supplied with water from the Ottawa waterworks. That city has also taken over the Ottawa East waterworks.

The contract for 4,200 feet of cast iron water pipe for the Oak Bay municipality, Victoria, B.C., has been awarded to W. G. Winterburn.

E. A. Wallberg, Montreal, is putting in sewerage and waterworks systems at the I.C.R. buildings at Moncton, N.B. The cost is estimated at \$60,000.

The V. Stanton Iron Co., of London, Eng., has received an order for 300,000 tons of iron piping for water, gas and other public works from the council of Victoria, B.C.

The Ontario Provincial Railway and Municipal Board has confirmed the by-law passed by Port Elgin to raise debentures to the amount of \$10,000 for a waterworks system in that town.

The civic waterworks committee, Ottawa, has approved the recommendation of the city engineer for the immediate construction of that section of the new aqueduct which is to be built near Kopean Bay, at estimated cost of \$74,000.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, July 13.—Supply houses report good orders going through with a stimulating increase in bulk as the days go on. Prospects for the autumn become more and more promising, and it looks as if record business will be done then. As a matter of fact many houses have been astonished to find on roughly estimating the business transacted up to the present month that the returns are much higher than they believed would be the case. This shows how foolish it is to look upon the dark side of things, and to imagine one's trade is bad because the general opinion as to business conditions seems to point that way.

Although building has not turned out to be so active this summer as it was last, there is plenty of work offering, and plumbers are fairly busy. As is always the case, some of the shops have even more than they can do. Some good contracts are developing for the autumn in the business sections, and there is likely to be no falling off in the residential property. Outside work, too, continues brisk, while jobbing is keeping many a small shop at full time.

Iron Pipe—Heavier bulk is moving, while bookings are showing good strength. Stocks in consumers' hands are low, and there should be a heavy buying movement before long. Iron pipe is more than ever in use, and remembering the difficulty last year in getting supplies, consumers should not hold off long, or they may find themselves held up again. We quote: $\frac{1}{4}$, $\frac{3}{8}$ and 1-in. pipe at \$2, \$2.25 and \$5.28 for black, and \$2.86, \$3.08 and \$6.93 for galvanized.

Soil Pipe—Soil pipe is in better demand especially in outside districts. Inquiries point to heavier trade in the future. We quote: Light, 3 to 6 in. 60 off; medium and heavy, 2 to 6 in. 70 off; 8 in., heavy, 40 off.

Lead Pipe—Lead pipe is moving well, there being a strong call for residential buildings. We quote: Pipe and waste are at 30 and traps and bends at 50 per cent.

Solder—Trade is somewhat quieter again, but fair orders are moving out. A strong demand from the roofers is expected shortly. Prices have not been changed locally and we continue to quote 19c for half-and-half, and 18 for wiping.

Enamelware—Business is improving, while inquiries point to heavier orders in the future. There is a likelihood of some good contracts going through. While there is a lot of cheap stuff on the market the better lines are going ahead strongly.

Brass Goods—The cheap lines are now somewhat of a drag on the market, but the standard lines are holding well.

Compression work is quoted at 65 per cent. and fuller work at 70 per cent.

Radiators and Boilers—The demand is improving, and some good orders have been received. We quote radiators at 52½ off, and boilers at 50 and 10 off.

Metals—There has been little change in the metal situation excepting in tin, which has had a further bulling movement in London. We quote: Ingot copper, \$14; ingot tin, \$32; lead, \$3.60; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, July 13.—Improving business is reported by all the local houses. The city trade is as good as ever and the country business is coming along exceedingly well.

Prices are much the same as formerly and, with the exception of closet combinations, stand as at last quotation. The cheaper grade of these combinations has gone up one dollar, though it is likely the crating charge of 40 cents noted in our last report will be cut in half on account of the advance.

There is a likelihood, too, that brass goods will advance shortly. There is, however, no change in price as yet.

The fall outlook is more than good, and a large volume of business is expected to be done.

Iron Pipe—Prices remain at last quotation—\$6.76 for 1-in. galvanized and \$5.11 for 1-in. black. Cast iron fittings are unchanged at 65 and malleable fittings run from 35 to 37½ off. Demand is active and supplies good.

Soil Pipe—Light pipe 60, and fittings 70 per cent., and medium and extra heavy pipe and fittings at 70 per cent., are still the quotations ruling the market. A good business is being done with plenty of supplies.

Lead Pipe—Fair business, with excellent trade in prospect, appears to cover this line. Prices are unchanged, pipe and waste still being at 30 and traps and bends at 50 per cent. Caulking lead is at 4½c to 5c.

Solder—Business, though fair, is a little on the light side just at present. Price quotations are still at 19c to 20c for half-and-half and 18½c for wiping.

Brass Goods—A little more activity is noted in brass goods lines. Quotations are still as noted two weeks ago, though there is a likelihood of an advance. Fuller work, 70 per cent., and compression work, 65 per cent., continue to be the prices asked.

Enamelware—All prices remain as at last quotation. The decline hinted at a fortnight ago has not yet materialized, and manufacturers have not yet issued new lists.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

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In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

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650,000 —Not one of the 650,000 retail merchants who have bought a National Cash Register would think of doing business without it. The National Cash Register Co., F. E. Mutton, Canadian Manager, 129 West King Street, Toronto, Ont.

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PIPE CUTTING MACHINE—1 in.-6 in. Jarecki; also Saunde machines, 1-4 in.-2 in., block dies and Borden dies, hand or power. Box 730, PLUMBER AND STEAMFITTER, Toronto. [13]

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Porcelain Closets—An advance of one dollar has been made on the plain wash-down closet combinations, though the prices of higher grades remain unchanged. It is likely that the crating charge of 40 cents levied on all combinations will be cut to 20 cents as a result of the advance. Business is fair, but prospects are splendid.

Boilers and Radiators—This line continues to be in very active demand. Prices remain steady and unchanged. The hot weather has not at all acted as a deterrent on buying.

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Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

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American Sanitary Plumbing. By J. J. Lawlor	2 00	Lighting by Acetylene Gas, Electric Furnace Generators & Burners. By W. E. Gibbs, M.E.	1 50	Principles of Hot Water Supply. By J. W. Hart	3 00
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Contract & Estimate Record Book for Plumbers. By B. H. Jessup ..	1 50	Modern Plumbing, Illustrated. By R. M. Starbuck	4 00	Repair Kinks. By Martin L. Kaiser	50
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Contract & Estimate Record Book for Steam & Hot Water Heating. By B. H. Jessup	1 50	Notes on Heating & Ventilation. By J. R. Allen	2 00	Sanitary House Drainage; Its Principles & Practices. By T. E. Colman	2 40
External Plumbing Work. By J. W. Hart	3 00	Outline of Ventilation & Warming. By W. J. Baldwin	1 00	Sanitary Plumbing & Drainage. By J. W. Hart	3 00
Fifty Plumbing Charts	25	Plumbers' Text Book, 300 Questions and Answers. By Frank Tower	1 00	Sanitation in the Modern Home. By J. K. Allen	2 00
Formulas & Tables for Heating. By J. H. Kinealy	1 00	Plumbing Catechism. By C. B. Ball and H. T. Sheriff	1 00	Sizes of Flow & Return Steam Mains	50
Furnace Heating. By W. G. Snow	1 50	Plumbing & House Drainage Problems	2 00	Steamfitters' Computation and Price Book. By Dean	3 00
Guide to Testing Plumbing. By J. K. Allen	25	Practical Gas Fitting	1 00	Steam & Gasfitters' Text Book..	5 00
Heating & Ventilating Buildings. By R. C. Carpenter	4 00	Practical Hints on Joint Wiping, for Beginners in Plumbing ..	25	Steam Heating for Buildings. By W. J. Baldwin	2 50
Hints to Plumbers on Joint Wiping, Pipe Bending & Lead Burning. By J. W. Hart	3 00	Practical Heating, Illustrated. By A. G. King	5 00	Steam Heating & Ventilation. By W. S. Monroe	2 00
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The Way of Musette.
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Some Fashions for Busy Men.
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Improvements in Office Devices.
Some Rather Unusual Events.
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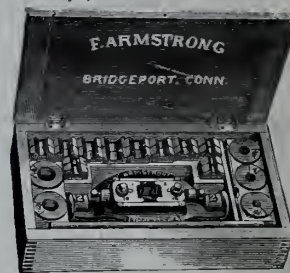
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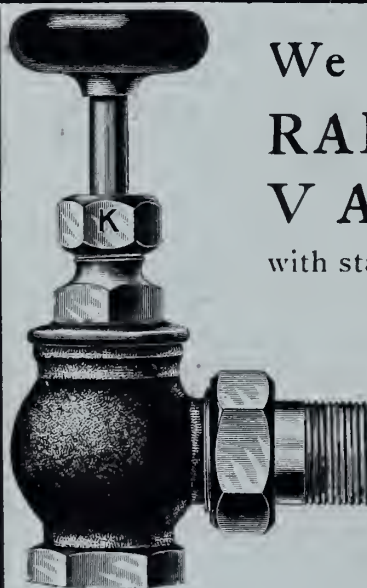
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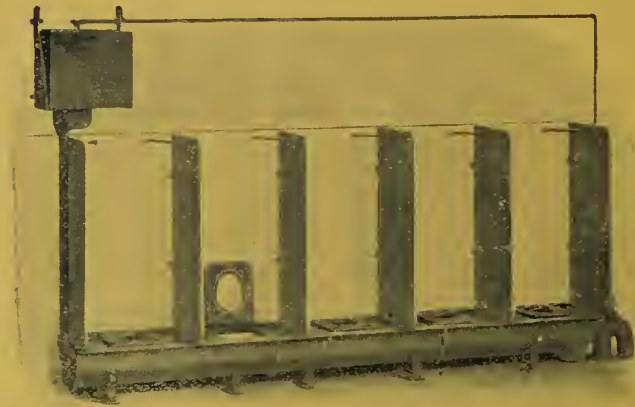
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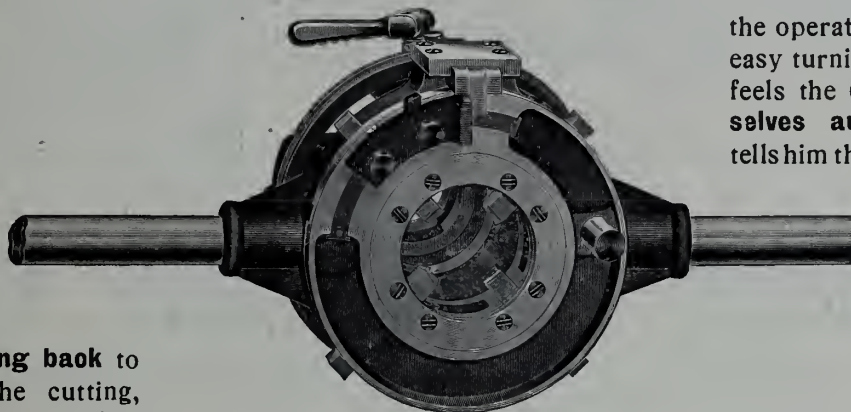
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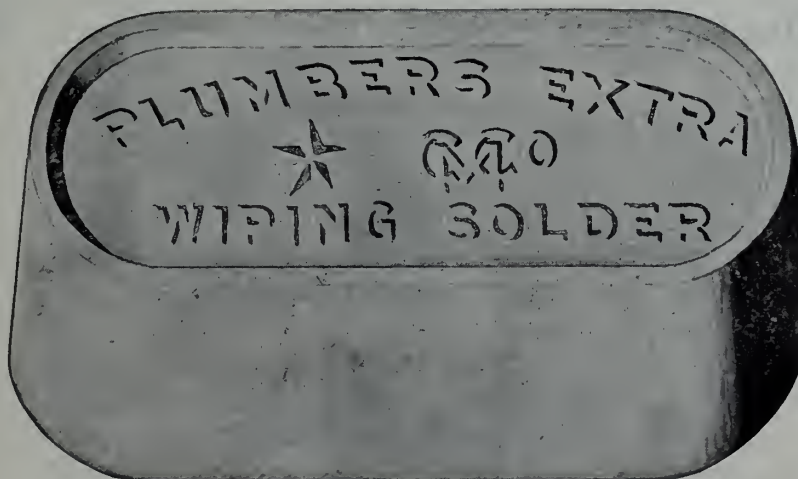
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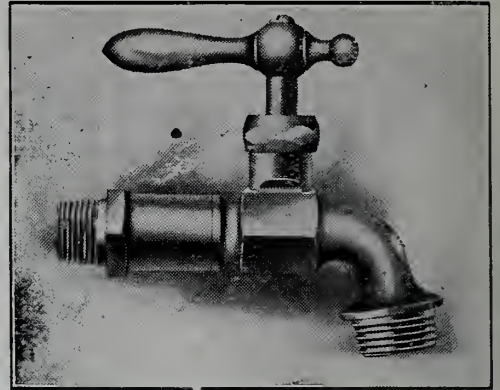
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MONTREAL, TORONTO AND WINNIPEG, AUGUST 1, 1908

ATTEND THE NATIONAL CONVENTION.

It is important that the thirteenth annual convention of the Canadian National Master Plumbers' Association to be held at Montreal on Thursday and Friday, August 13 and 14, be attended by a representative body of delegates from all parts of Canada.

With a decided movement towards re-organization evident in Ontario it is necessary that the National convention this year be a successful one and devoted more to business than pleasure, although the entertainment features cannot be overlooked when master plumbers get together.

With half a dozen of Canada's leading cities revising their plumbing by-laws and with numerous other places which either have no by-laws at all or by-laws which require amendments, there is work for both a sanitary committee and the convention.

The National M.P.A. of the United States, a report of whose convention appears in this issue, has won high praise for its work on behalf of public sanitation, and with a little effort the same results can be secured in Canada.

The objects of the M.P.A. are so plausible and beneficial to both the trade and public that they are bound to win recognition sooner or later—sooner if the trade realizes its duties and responsibilities.

David Craig, the Canadian who was honored by election to the presidency of the National M.P.A. of the U. S., recently said: "Loyalty to the National Association of Master Plumbers must be whole-souled and of one piece on the part of all of its members. Nothing else is any good if you want perfection of the association idea. We are all liable to be a little impatient of results; but look at the organization; look at what it has brought about, and be a little bit patient and all will be well. At the same time bear in mind that we should pursue an even honest course before the public. The public weighs no one wrongly. You can fool some of the people all the time and all the people some of the time, as Lincoln said, but the general public will measure you right, and I will take the general public's opinion. Don't forget that you stand before the public as representative merchants, and as representatives of a craft; and God knows we have a beautiful heritage handed to us. You stand to wipe out those impressions, and why don't you try to do it? The point is, an honest, straightforward position is always the best. It doesn't pay sometimes,

and more times it is actually a loss to pursue it, but in the long run the situation is a great deal bettered by this honest, conservative action."

The new dates set for the Montreal convention afford a little more time for delegates to make arrangements to attend and it is to be hoped that when the convention passes into history it will win the same measure of praise as the Boston convention has won from the trade across the line.

Make Montreal on August 13 and 14 a rallying point and boost for a successful convention.

CANADIAN HEATING ENGINEERS SHOULD ORGANIZE.

Niagara Falls on July 24 and 25 was the meeting place of the summer convention of the American Society of Heating and Ventilating Engineers, an organization which has about half a dozen members in Canada.

About seventy men who earn their living by studying and overcoming heating problems attended the convention and some decidedly interesting discussions took place on papers read or topics presented by different delegates. Two of the papers are published in this issue.

Canadians have taken an active part in the work of the society, the president, James Mackay, Chicago, and the secretary, W. M. Mackay, New York, being former Canadians, and brothers of Alexander Mackay, of Montreal. Prof. Kent, another leading member, also hails from the Maritime Provinces, while Norman and F. S. Whitelaw, of the American Radiator Co., are former Toronto plumbers. T. B. Cryer, now of Newark, who learned his trade at London, was also at the Niagara Falls meeting.

An outgrowth of the Niagara Falls meeting will likely be the formation of a Canadian chapter of the society, with headquarters at Toronto, and steps to this end are now being taken. It is proposed that an organization meeting be held about October 1, with the president and secretary of the American society present. Meetings could then be held monthly and following a lunch a discussion held on some previously-announced subject. Once or twice a year some prominent members of the American society could be brought over if thought desirable, while an invitation could be extended the American society to hold one of its summer conventions at Toronto, at which Canadian heating men would have the benefit of discuss-

ing heating and ventilating problems with the men who are the writers of text books and recognized as authorities on the subjects.

In the next issue of The Plumber and Steamfitter an outline will be given of the basis on which the American society is formed, and in the meantime those who desire to see the proposed organization brought into existence are requested to forward their names to the editor of Plumber and Steamfitter. A committee can then be organized to arrange the preliminaries and issue invitations to the organization meeting.

NOT ROOM FOR TWO.

While it will be generally conceded that any form of organization conducted on legal lines is better than no organization at all, there is such a thing as having too much of a good article, and the plumbing trade in Toronto is in this position to-day with two Master Plumbers' Associations. Steps have been taken, however, to unite the two under one head, the parent organization having appointed a committee to meet and discuss with the young association, who, having the interests of the trade at heart, are likely to facilitate the movement to unite the two associations.

United there is no limit to the possibilities of the association, and as with past experience as a guide, the officers will be careful not to overstep legal bounds there is no reason why any in the trade should not affiliate. In fact, organization will be the only salvation to many firms who managed to pull through last winter, but seem likely to be a year hence again working as journeymen.

The trade throughout Ontario is looking to Toronto master plumbers to get together into one organization and take the first steps towards bringing a provincial movement into existence.

ESTABLISH NIGHT CLASSES THIS FALL.

The higher education of the plumber being admitted to be most essential, the question comes, how is this development to be attained. In the first place a master plumber, no matter how interested he may be in the training of his young employes, has very little time to devote to their theoretical knowledge. In these days when competition is severe, and contracts have to be carefully made out so that there shall be no chance of a loss on the fine price necessarily quoted, the master plumber has little spare time. He cannot afford to give up an evening or two for instruction, and while engaged on a job he has quite enough to do to see that the execution is all right without going into the reason why the work is done that way. Then again, there are the men who, while being excellent workmen in their way, are not capable enough to instruct their employes, even though they have the time and the desire to do so.

It is not an easy matter for young men to teach themselves. In the first place text books, no matter how simply the authors may have written them, are full of knotty points to those who have to solve everything for themselves, and who are naturally lacking the greater experience of an old hand to guide them. Then again, there is the question of application which enters into the single-handed study of an apprentice or helper. He may be fully determined that he will devote so much time every week to study, but after a while, with only his own determination to spur him on, and probably tired by a hard day's work, with no set schedule before him,

he gets slack, shortens his reading, and eventually gives it up. If on the other hand, he was in competition with other students of his own age, was under some restriction which would tend to keep him at his task, the difficulty of application would largely be overcome. Apart then from the valued help of an advanced plumber, which, as we have said, can very seldom be given, there are only two courses open, plumbing classes and correspondence schools. The latter, undoubtedly, are of great help to a young man in working his way through his text books, but their value cannot be compared with the night classes, and the viva voce explanations and illustrations of an instructor.

To the night classes, therefore, we must turn to supply those educated men who it is hoped one day will constitute the plumbing trade. With the increasing strictness of the plumbing laws, with the searchlight of public attention fixed with increasing intensity upon the work done, the time has come when the young plumber must demand at the hands of those responsible for the welfare of plumbing generally, the opportunity to acquire that education which is being required of him. The Board of Health or whatever organization is responsible for the plumbing of a city, town or district, helped by the plumbing trade itself, must seriously take the matter up. Every plumber knows the value of education. He knows that as his work becomes more scientific, so will his status in the world's trade improve. An incompetent plumber, who cannot see further ahead than the carrying out successfully of a slovenly piece of work at the greatest profit to himself, will naturally not favor any step which will tend to improve the young employe and at the same time tend to show up his bad work. On the other hand, the good workman, who realizes the disadvantages under which he suffers, whose motto is better plumbing and the advancement of his trade, will welcome any project to give to others advantages which were denied to him.

Montreal already has night classes for young plumbers to attend and it is up to the trade in Toronto and other cities to see that the technical and night schools provide the means for the extension of education along the lines suggested.

SELLING OUTSIDE THE TRADE.

There is no worse competition existing to-day for the plumber and steamfitter than that caused by the habit on the part of some of selling direct to the consumer at the very lowest trade prices. Many manufacturers and wholesalers have been forced to it by the actions of others, but too often it is brought about by over anxiety to effect sales.

It is surely a mistaken policy that works good to neither the plumber and steamfitter or the public. The consumer loses the assistance and knowledge of the real needs in the selection of his materials that is possessed by the experienced trade and is most frequently displeased and dissatisfied in the end.

The public is not benefitted in the end and the trade is deprived of its just dues. Nothing can do greater harm to the trade, it lowers the standard of the business and decreases the means of properly meeting the obligations of the trade. It lowers the level of compensation to the plumber and steamfitter and is a genuine slap at his intelligence. It lowers the standard of work and is prejudicial to the well-being of the community.

U. S. Master Plumbers' National Convention

About 1,500 Attend the Twenty-sixth Annual Convention at Boston—Interesting Comments on the Relation of the Plumber and the Law—Substantial Gain in Membership.

Twenty-five years of organization has left the master plumbers of the United States with a membership of 9,021, a gain of 267 during the past year, despite reverses in Ohio, where the law officers have been endeavoring to disrupt the association. The twenty-sixth annual convention at Boston on July 14, 15 and 16, attended by about 1,500 delegates, their wives and their friends, was an indication of the strength of the association and a tribute to the value of the organization to the trade.

The lesson to Canadian master plumbers is obvious—if they wish a change from the exceedingly unsatisfactory condition of affairs existing in most Canadian cities they must follow the path blazed by the trade across the line. There, a reading of the report made by President Hill will show, the association work is entirely within the law, and the organization is recognized as a benefit to both master plumbers and the public. To inspire Canadian plumbers to strengthen their local and national associations a summary of the most interesting reports made to the convention at Boston is given below.

President Hill's Address.

One of the most important matters left to me by my predecessor in office was the condition existing in the State of Ohio; our membership there was the object of attack and prosecution, principally in Toledo, Lima, Fremont, Elyria, Ashtabula, Sandusky, Cleveland and Mansfield, and were in quite a serious state. We were losing members in large numbers, due to their desire to avoid litigation, and not having the proper confidence in their state officers who strongly advised them to remain and fight the issue. Ohio also shows a larger loss of members in percentage, from non-payment of dues of local associations and local members, than any other State. I tried to get at the facts of the case from the Toledo officers and the Ohio State officers, both of whom denied the existence of any local agreement of any possible character. When I finally received from Ohio a request to leave off the entire membership on Toledo from our September Red Book, I decided to make a trip to Toledo and find out the real cause of the trouble; feeling that to omit the names of an entire association that was being prosecuted, and in the face of an attack, was of more importance to the National As-

sociation than the current per capita tax, if the same was not paid.

In the first week of September I visited Toledo, and there met some of the members and officers of the Toledo Association, and Messrs. Morgan, Ellen and Roberts representing the Ohio State Association, also Judge Hamilton, counsel of the Toledo Association. In taking up the matter of the omission of the names with their counsel and the good it might result in to the indicted members, Judge Hamilton did not think it was important to the ultimate issue of the case and did not recommend it. After some investigation, in which I was aided by the Ohio State officers, it developed that the minute book of the Toledo Association, which was in the hands of the Prosecuting Attorney, plainly showed the existence of an agreement—a purely local one. This is, of course, something that the National Association, in all its literature and printing, which is a source of great expense, has advised and repeatedly cautioned against. The question there is not purely a national issue, and up to the present time there has not been a trial of the case. Judge Hamilton stated that he did not think the matter would ever be brought to court, and if it was, he was almost certain of a decision in favor of the master plumbers.

As above stated, we have lost a great many members in the State of Ohio, on account of the reasons above outlined, and on account of the application in that State of a law which I believe you are all familiar with, and which there is no necessity of discussing at this time, beyond the fact that I believe the same spirit of organization that has placed Ohio at times among the banner State associations, will ultimately bring them back into line, and that the State is in the hands of men who will see that the ultimate good result will attain.

Investigation by Federal Authorities.

Our members in Mobile and New Orleans were subjected to an investigation by the Federal authorities, which resulted in their indictment. These matters are still pending, and there has been no trial of the issue, nor do I believe there will be, unless we should deviate from our present policy, which is supposed to be, and is, according to law.

In connection with this matter, we learned through the assistance of Thomas J. Young, Mobile, that the Washington authorities were going to investigate our

association, and that they would like to have an interview with us—that is, your officers. Having nothing of a secret nature, and being convinced that we were a legal corporation and association, a meeting was arranged with the Department of Justice at Washington, and Mr. Cochrane, Mr. McCoach, Mr. Young, Mr. Crosby and myself attended two meetings with the special agent of the Attorney-General in charge of all the prosecutions under the Sherman law. We thoroughly explained to them our working basis, the brown book and the red book (both of which were already on file in Washington), and went into the details of our organization as thoroughly as we possibly could. This had evidently been done before, but never by any one in authority and in full possession of the facts. We denied any agreement with the manufacturers and dealers which some one had informed the Attorney-General we had, and, as a matter of fact, had a far more pleasant interview and time than we had been led to expect—though at all times we were within our rights in our opinion.

We could get no opinion from the Department of Justice on our organization. We got no counsel from him, for he was not engaged by us; but I feel that our visit was successful and did us a great deal of good for several reasons. We had been deliberately misrepresented to all authorities as an unlawful combination—restricting prices and work. Further, the fact of four of your officers visiting the Attorney-General in his office, without counsel of any kind and with no one to represent them or to speak for them but themselves, was in their favor. We also surprised the Washington people when we informed them that none of the officers received any remuneration whatsoever. In view of all these facts I believe we surprised the Washington authorities by our candor, to say the least, and I believe our National Association is now honestly understood by the people we all respect and from whom we can expect a square deal—which is all we want.

The gentleman who interviewed us and questioned us extended us unexpected courtesy, and we invited him to our convention to see for himself what delegates from all over the entire United States met in convention for and to show him that information given him was correct.

The future, as far as any action in the matter of federal investigation is concerned, is problematical, but I do not fear the issue.

National Association Protects Members.

When we consider the magnitude of our undertakings; when we consider the doubtful nature of the ultimate end of our controversies, and in almost every instance the favorable manner in which they have terminated, we should find the greatest possible reason for gratitude to our National Association, and rejoicing on the part of every one a party to it that he is a part of the wheels of government.

My conception of the matter impresses me strongly that the local associations separately are too much engaged in their local concerns; too much engaged in that part of organization that the National Association never was and never will be a part of, and which it has on innumerable occasions denounced and repudiated. While every local association feels an immediate and particular interest in union, all the locals combined cannot fail to find in a united mass, or means and effort, greater strength, greater resource, proportionately greater security from external danger, a less frequent interruption of their peace by outside elements, and, what is of inestimable value, they must derive from the national affiliation and membership an exemption from those broils and entanglements between themselves which are so liable to afflict organizations not united in a national body.

As a national association we are not much different from a great many fraternal organizations, some of which you are, in one way or another, affiliated with. But there is this difference: Our protection is extended to your home and fireside; we attain and give you during life what you pay much larger sums for, and which in receiving after death some of the large fraternal organizations have fallen down. There is a great item of the present in the benefits of the National Association of Plumbers. There is also a future in it as long as the members support it with the same loyalty and devotion that have been characteristic of the past. I desire to extend my felicitations to the entire membership and thanks for your prompt replies to correspondence with the national office.

I believe the National Association is stronger to-day than it ever was, and has the same members whose characteristics are apparent whenever we have anything of an organization issue at stake; and I desire to again thank you for the honor you conferred on me when you gave me a chance to peep in at the inner workings of one of the best organizations that I have ever been connected with.

Use of Rubber Stamp.

After a thorough discussion of the question the following resolution was adopted:

"Whereas, at the present time the master plumbers throughout the United States are continually put to a great deal of annoyance and unlimited expense through the replacing of fixtures and material furnished by jobbers and manufacturers, which have proven defective through manufacture after installation, and, whereas, owing to the organized effort on the part of the jobbers and manufacturers in refusing to allow the master plumber any recompense for replacing such defective fixtures and material, he is unable to cope with the situation individually and is obliged to bear such loss without recourse, therefore be it resolved, that the National Association of Master Plumbers adopt and recommend the use by all members of national, state or local associations, of the following notation on all purchase orders for material, either in printed form or by use of rubber stamp: Should any of the goods on this order prove defective through manufacture before or after installation, such goods will be replaced free of expense to the purchaser."

Sanitary Committee's Report.

A most painstaking report was submitted which took cognizance of the pronouncements of Major Horrocks, who some years ago at Gibraltar, in a number of experiments with drain piping and the like, arranged in a practical manner, gave to the sanitary world the positive belief that sewer air was a decided means of disease propagation, requiring the special measures now characteristic of plumbing installations taken to prevent its diffusion. Experiments exactly along the lines of those of Major Horrocks were repeated, and the conclusions do not corroborate the Gibraltar work because of the fundamental difference that Major Horrocks' work was what may be regarded as qualitative and not quantitative. That is, a single germ of a deleterious nature might be found in a volume of 100 cubic feet of air, but if the hunt for the bacterium were made in measured quantities of 1 cubic foot at a time, the particular micro-organism would be found in only one of the hundred samples.

Some of the findings were: The class of bacteria expected with sewage was found in the air immediately above the fluids in a large Boston sewer, but a greater quantity was found in the air higher above the liquids, with the greatest number in the street air itself, indicating that the bacteria from street droppings and the like were a far more serious menace than those thought to emanate from sewage. Experiments

were made of the air in the laboratory where the work was largely conducted. Definite measured quantities of air were considered, usually by drawing it into a bottle of 1 liter contents, roughly, 1 quart. In 30 samples of 1 liter each of the laboratory air, the specific bacteria were found in five only, with three each in four of them and one only in the fifth.

Test Made of Sewer Air.

A porcelain water closet was set up, with an S trap and a 4-in. running trap, and an emulsion rich in the bacteria was passed through the fixture and piping, foaming and splashing on the way. Samples of the contained air were taken from the traps and at other points, and in the 44 samples taken there was none of the bacteria in 43 and in the other one group of 11, these believed to have been carried by a single drop of the liquid, which may have been carried into the sampling bottles. It will be understood that each bottle was provided with a properly prepared plate for catching the bacteria and providing for their growth and consequent multiplication and examination. The idea is that the specific bacteria found by Major Horrocks were noted, but they were small numerically and the amount of air infected so small that the conditions cannot be considered a menace.

Examinations were made of house drain air. Nineteen different systems were investigated—five in the buildings of the Massachusetts Institute of Technology, four in the Boston City Hospital, three in East Boston tenements, two in the City Hall, two in the Hotel Lenox, one each in two office buildings and one in a private residence. The pipes were tapped in the main stack, both at the top and bottom and on cleanouts, dead ends and in one case in the ventilating system at a distant point. Ten liters were taken from each point, 200 altogether; three were spoiled through the accidental introduction of the liquids, leaving 197. In 193 no bacteria were found, while in four were obtained the intestinal germ. The investigations were made when there was splashing and spraying of the liquids in the contained air, and in every case a sample was taken 10 minutes later, but no bacteria discovered.

These investigations were regarded by the committee as proving conclusively that sewer air is not the bugbear that it has been regarded in sanitation. Intestinal bacteria were found in only four out of the 200 samples, and then only in samples taken at the direct point of infection. The report showed that in breathing drain air for 24 hours one would take in, say, 50 intestinal bacteria, while the individual drinking water as pure as that provided for New York City would receive twice as many of the

specific bacteria in the same time. Breathing sewer air might place the body open to attack from the specific germ in the air, and in that way it might be regarded as unduly prejudicial to health, the point being that the healthy human organism is capable of providing its own antitoxin for counteracting the bacteria, but that requiring too much of the body in this direction is not advisable.

Corrosion of Galvanized Pipe.

The committee also took up work in the interest of conditions found to exist in cities of the Middle West in the case of trouble from galvanized water piping. Such pipe was found almost completely choked with a yellowish white substance which, when removed, took the coating with it. Black iron tubing had comparatively little deposit, and what there was was hard scale. Brass piping had no deposit at all. The waters of the cities in this section are treated for purification, largely with a chemical coagulant, in the case examined with iron sulphate. The deposits were found to contain 84 per cent. zinc oxide, and the investigations pointed to electrolytic action, the current of electricity being set up through the use of the galvanized coating, on the one hand, and brass faucets and the like on the other, together with the peculiar character of the water itself. It was found that water stained with vegetable material, by adding to it the steeping of dry leaves, helped very materially to prevent the action through the deposit which the stain makes on the galvanized coating; and the inference is that removing the coloring matter from the public water supply tends to make matters worse. The remedy suggested is the removal of brass work or the substitution of lead pipe for the galvanized.

Association Wins High Praise.

In closing his review of the report, Mr. Craig read a letter from a man he unqualifiedly described as the foremost sanitary engineer of the world, Prof. W. T. Sedgwick, of the Massachusetts Institute of Technology. The letter laid great stress on the high character of the work done and vigorously advised the publication of the report in some form for permanent record and ready access. He commended the association for being broad enough, scientific enough and energetic enough to do the work, and stated that all sanitarians stood indebted to it. The report was given close attention throughout, and after the expression of the desire to perpetuate the work in some way Mr. Craig has been asked to look into the question of publication.

Election of Officers.

W. H. Halsey, Milwaukee, was elected President; Walter D. Nolan, Washington, Vice-President; P. H. Murphy, Milwaukee, Secretary, and Wm. McCoach, Philadelphia, Treasurer.

QUALITY OF PLUMBING GOODS.

The stand for honest goods taken a month ago at the joint meeting in Detroit of the members of the Central and Eastern Supply Associations was made effective by adopting the report and the recommendations of their Committee on Weights and Capacities. The report is presented herewith, introduced by the remarks made on its presentation by N. O. Nelson, of St. Louis:

"It is notable that in this convention of manufacturers and wholesalers the sittings have been with open doors; there has been no consideration in any manner of raising or of regulating prices; nothing has been done in the direction of stifling competition, or restricting output, or of antagonizing either our employes or our customers. All that we have done has been in the interest of the public and honesty in business. Our convention has unanimously decided that goods which have a standard must be true to brand; that the warranted size and thickness shall be stamped or labeled on range boilers, lead traps and bends, soil pipe and fittings. This publicity and warranty of honesty is to be directed and enforced and a label furnished by the National Committee, under its effective but not burdensome authority. We may hope that other associations of manufacturers will follow our example. Without meaning to be dishonest, the tendency has been on the part of some manufacturers to reduce, little by little, sizes and weights and quality. I apprehend that every manufacturer and job-

ber will be glad of this rule and will be glad to see it applied to other less important articles in the future. It may well be a matter of pride to us that we recognize our responsible positions as captains of industry, accept our duties as freely as we claim our rights."

Report of Committee.

This committee recommends that the present standard weights of soil pipe be adopted, viz.:

Standard Soil Pipe.				
Size in inches	2	3	4	5
Weight per length, in pounds	17½	22½	32½	42½
Size, in inches	6	8	10	12
Weight per length, in pounds	52½	90	125	150
Extra Heavy Soil Pipe.				
Size, in inches	2	3	4	5
Weight per length, in pounds	27½	47½	65	85
Size, in inches	6	8	10	12
Weight per length, in pounds	100	167½	220	270

Observance Through Ordinances.

That all due effects be made to secure the adoption of ordinances in the principal cities or in States in conformity with this resolution.

This committee recommends that in city ordinances and State statutes it be provided that the soil pipe fittings be required to conform in every essential particular to the soil pipe for which they are intended.

This committee recommends that manufacturers shall cast on soil pipe fittings their name or initials, and the designation "extra heavy" or "standard," as the case may be.

This committee recommends that on lead traps, bends and ferrules the thickness of the walls and the total weight must not be less than the schedule adopted in the standardized list of trap manufacturers issued June 3, 1901, and revised in January, 1907, and that the manufacturers be required to stamp each piece of goods with their names, and that it conform to the schedule of dimensions bearing such date, viz.:

Standard Weight Lead Traps and Bends.				
Size, in inches	1¼	1½	2	3
Weight of lead per running foot, in pounds..	1½	2¼	3¼	5
Extra Heavy Weight Lead Traps and Bends.				
Size, in inches	1¼	1½	2	3
Weight of lead per running foot, in pounds ..	2½	3½	4½	5

This committee recommends that all range boilers shall be stenciled with their warranted capacity of water in gallons; also that all range boilers shall be stenciled with their thickness of shell and decimal inches, and that labels be furnished manufacturers by the National Committee of the Confederated Supply Associations upon satisfactory assurance that they will conform to this resolution.

The recommendations were approved, and a committee is now engaged in seeing that they are put into effect.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

IS FROST TOO HEAVY?

John H. Kelly, sanitary engineer, Regina, writes: "I have read with great interest the article in your journal by M. J. Quinn on Septic Tanks and Sewage Disposal, and should like to ask what he would propose the best way to discharge the contents of a septic tank in a country the same as we have here. The soil is heavy clay loam and the temperature in the winter goes down as low as 50 degrees below zero, and the frost penetrates into ground seven feet, and I am afraid the laterals one foot below the ground would be no use here."

Mr. Quinn, who has had several years' practical experience with septic tanks in connection with experiments conducted by the Ontario Board of Health, and is also the inventor and manufacturer of the Dominion flushing valve, widely used in septic tanks in all parts of Canada, states that he examined this summer a number of septic tank systems in Saskatchewan and Alberta that were installed late last fall, and were in continuous and satisfactory operation during the whole of the winter, notwithstanding the fact that according to statements the frost penetrates the ground about 7 feet, and in each instance the soil was pretty heavy clay.

There are, perhaps, 1,500 or 1,600 of these systems in Ontario, and he has never yet heard of a frozen tile.

Where the system is installed very late in the fall, when there is practically no natural warmth, it would be wise to protect both the tank and the tile system with a fairly heavy layer of stable manure, but where the system is installed early enough in the season to provide reasonable warmth for two or three weeks so that a vigorous bacterial action may be encouraged, then no fear may be entertained that the system will not work in an absolute satisfactory manner.

COST OF SEPTIC TANK.

Thomas Shipcott, Elmvale, Ont., writes. "I am about to construct a septic tank system and wish information as to the probable cost, as they are a new thing here?"

M. J. Quinn, Toronto, supplies the following figures: The cost of the septic tank valve to the consumer is \$20 net, f.o.b., Toronto; the two iron bends required to hold and receive the valve and for the over-flow between compartments No. 1 and No. 2, respectively, are worth about \$3, while the tank itself, for an

ordinary house, should cost anywhere from \$15 to \$25, according to local conditions. The field tiles for an ordinary job would be worth about \$5, and the labor of installing them, say \$5 more, making a total of approximately \$53. To this, of course, would be added the contractor's profit.

EXTRA COPIES WANTED.

Rogers, Wray & Greenway, Grimsby, write: "Would you be kind enough to send us a couple of extra copies of your issue of June 15, as we were much interested in the explanation of a septic tank which was so fully outlined. We were unfortunate in losing the only copy we had."

The copies have been sent with the request that questions on sanitary, plumbing, heating or ventilation subjects be forwarded to The Plumber and Steamfitter for reply. This department can be made a great help to the trade if readers take hold.

PARIS GAS FITTING REGULATIONS

The Prefect of the Seine has revised the regulations for gas fittings within buildings and dwelling houses in Paris, France, and replaced the ordinances of 1862 and 1868 by a new set of rules which, briefly summarized by the Gas World, are as follows:

1. All proposed work upon or use of gas fittings to be reported to the gas company.

2. The company to test the fittings before supplying gas. If not satisfactory, no gas.

3. Municipality and gas company to inspect fittings from time to time, and to test for leakage. Gas to be turned off if fittings out of order.

4. Service stopcock at the street door, in the thickness of the wall, to be accessible by a door, the key of which to be in the hands of the gas authorities. A second cut-off to be provided, the key of which will be in the charge of the occupier. A mark outside, showing that the company are duly supplying gas with their own sanction.

5. The service stopcock to be quite incapable of being opened without the aid of the gas company's representative.

6. All piping to be, as far as possible, in sight. If it goes through a wall, etc.,

it must run through a continuous metal pipe open at both ends, which ends must project at least 0.4 inch from the wall, etc. This pipe must have a bore at least 0.4 inch wider than the external diameter of the piping.

7. Stopcock plugs to have firm seats, so that they cannot be pulled out, even by violence.

8. Piping to be of iron, steel, lead, tin or copper, of the best quality.

9. All spaces through which piping passes, or which contain burners, to be well ventilated.

10. Looking for leaks with a flame is formally forbidden, even in the open air and places perfectly ventilated.

11. In case of accident, the gas company on being informed are to send at once to the spot and to notify the municipal engineer of the quarter.

12. Apparatus used must conform to the special regulations affecting them; otherwise gas to be cut off.

13. Consumers to be supplied by the gas company, along with their demand notes, with copies of the regulations, as also of instructions as to precautions necessary.

NEW HEATING ENGINEERS' COMPANION.

There has just been issued by the Gurney Foundry Co. a most complete Heating Engineer's Companion. It is a well printed and bound book of convenient pocket size, being well illustrated and showing the varied line of their goods.

Convenient tables of reference are arranged of such information as the heating contractor likes to have ready at hand at all times. Complete lists and prices are given of all materials usually used in the steam and hot-water heating trade. Still another feature is a valuable collection of data that is frequently required and very essential information to have in one's possession. The company make the claim that the Companion is the most complete pocket reference book as yet issued to the trade. Copies may be had for the asking.

C. E. Oldacre and F. E. Ellis, Gurney Foundry Company, Toronto; Charles W. Fortune, Sheldons, Limited, Galt; David Millar, Pease Foundry Co., Toronto; and the editor of Plumber and Steamfitter, were the Canadians who attended the convention of the American Society of Heating and Ventilating Engineers at Niagara Falls, N.Y., on July 24 and 25.

School Heating and Ventilating Apparatus

How Their Installation and Operation May Be Simplified Outlined by S. R. Lewis at the Summer Meeting of the American Society of Heating and Ventilating Engineers, Niagara Falls, July 24 and 25.

If there is any such thing as a standard type of heating and ventilating apparatus for school buildings in this country, perhaps the plant shown in the accompanying plan and marked No. 1 may be described as standard.

The boilers are of the ordinary horizontal return tubular type, and are operated at comparatively high pressure. The fan is engine-driven, and the exhaust steam from the engine is used in the heating system. The customary pres-

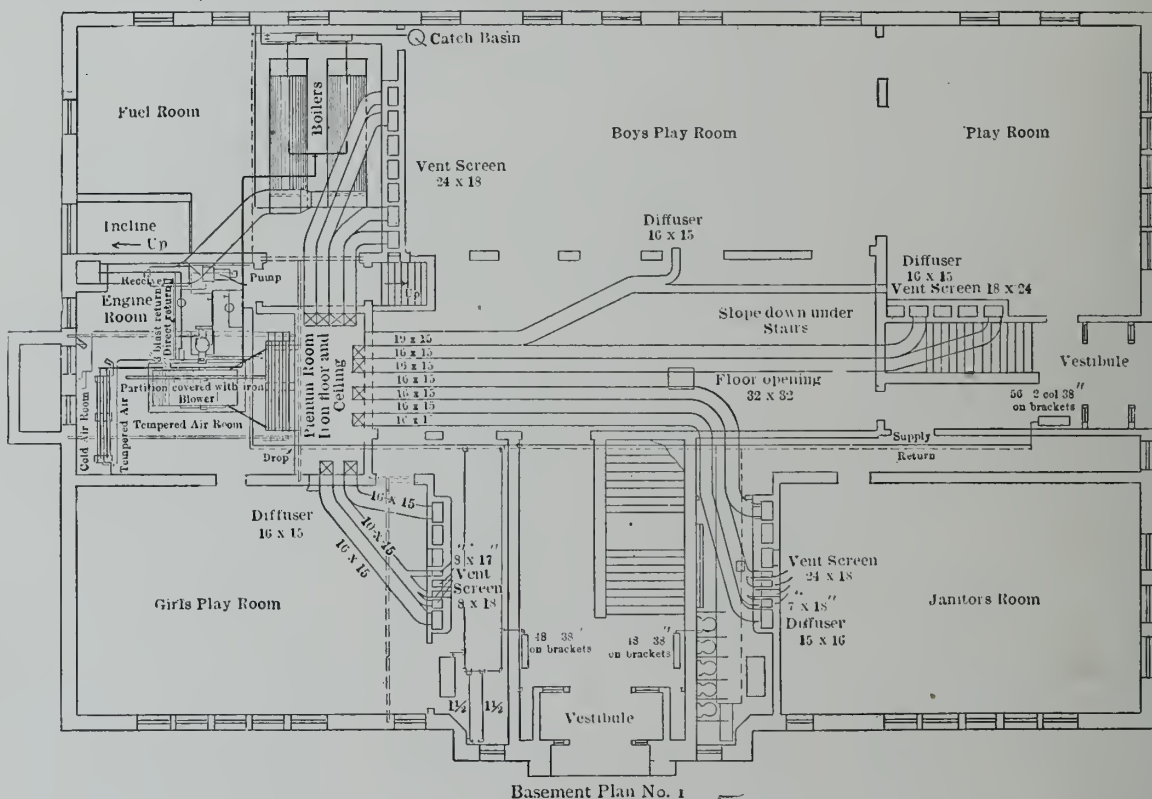
fer. This possibility has led in many instances to the installation of direct radiation as an auxiliary to the fan system.

If there is not a separate duct and mixing damper for every room, enough direct radiation must be installed in each room to heat the same independent of the fan, else the temperature of the building cannot be controlled. This leads to a heavy first cost, for practically two plants, the ventilating system costing

than the all-blast plants, and it is evident that they must require more attention and repairs.

The above reflections led to the development and installation of a number of plants of the type shown on plan No. 2, which seem to overcome the main objections to both of the previously described systems.

This type is subject to many modifications, and I do not claim that it should receive consideration over the old types



Basement Plan No. 1

sure-reducing valve, back pressure valve, grease extractor, etc., are installed. The water of condensation is returned to the boilers by an automatic pump and receiver. The air is tempered for cooling the building by approximately one-third of the heating coils prior to admission to the fan, and heated for warming the building by approximately two-thirds of the heating coils set in the fan outlet. This system, when carefully designed and intelligently operated, is probably more economical in operation than any other. If, however, for any reason the fan cannot be operated, the warm air will all go to the nearest and warmest rooms, and those with the greatest exposure and longest horizontal ducts suf-

fer very nearly as much as an all-blast system, the direct radiation being additional.

Objections to First Plan.

This plan is also subject to the following objections:

The direct radiation is constantly pumping foul air and dirt from the floor and mixing it with the fresh air at the ceiling.

The direct radiation causes local overheating and occupies valuable space in the rooms.

Well-authenticated records show that the combination plants above described are considerably more expensive in fuel

in every instance. I know, however, that for many installations it will give superior results. There is nothing especially original about it, it being merely an adaptation. It is easy in many instances so to locate the flues that it can be economically installed.

The boilers are set so that the difference in level between the base of the blast coils and the boiler water-line is about thirty inches. The coils are located in small plenum chambers at the bases of the flues. There is practically no direct radiation. The fan is motor-driven. The steam pressure may be anywhere from 0 to 20 pounds, or higher. The circulation is entirely by gravity. The air is tempered for cooling the rooms

by double dampers in the plenum chamber decks.

Advantages of Gravity System.

When the fan is stopped the rooms get a good flow of air by gravity, and are heated almost as efficiently as by direct radiation, while securing considerable ventilation. If any gravity furnace plant will heat, this steam plant will do so by gravity. The steamfitting is a trifle more expensive than with the first type, but infinitely less expensive than with auxiliary direct radiation. In many buildings this apparatus may be laid out with better economy of space than with any other type. It retains the advantages of the older apparatus and eliminates the faults without incurring the disadvantages of the still older type of blast plant in which the indirect radiation for each room is located in the flue leading to that room.

In engine-driven plants the layout is the same, care being taken that when the engine is not running the pump may be by-passed and the blast coils circulated by gravity. To this end, of course, a low water-line boiler and shallow blast coils must be used.

The steam piping must be generously proportioned, so as not to have undue false water-line. Tests with a water glass on the return drop, from a blast coil 75 feet from the boilers indicated that when the fan started, blowing air at 8 degrees below zero, the water stood about 26 inches above the boiler water-line, but soon settled down and remained constant at about 18 inches above the boiler water-line.

Wherein this plant fails to deliver results equal to the older types is not yet evident to me after two winters' experience and observation of several installations.

Furnaces With Fans.

There will probably always be a large number of school buildings heated with furnace apparatus. Anything like the same engineering skill and research as have been devoted to steam heating extended along this line would have given it a far better reputation to-day than it holds. The general availability of electric power, and the compulsory ventilation requirements, have given fan furnace heating a great impetus. The following seems to me prime considerations:

There is almost no furnace well adapted to any one fuel which is of much account for any other fuel.

Radiant heat does not warm very much air, and the heat from a furnace is largely radiant heat, which rises in great quantities directly upward from the fire. The most efficient furnaces will be found to have great weight of metal suspended above the dome so arranged as to ab-

sorb the heat and transmit it by contact with the rising air currents.

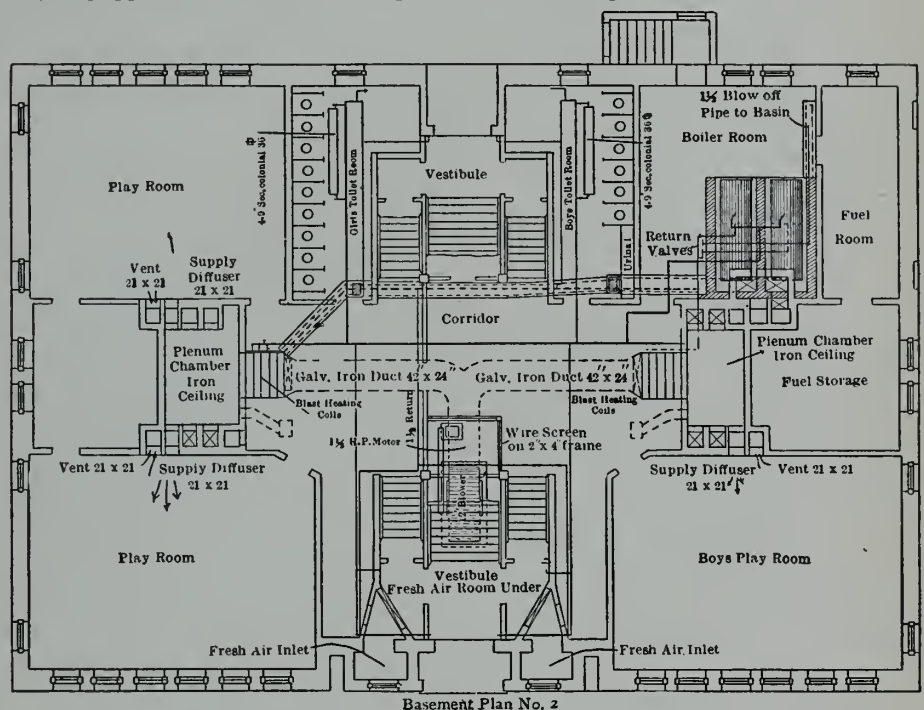
Because of the high air temperature possible, many furnace plants have been made to worry along with disc fans of inadequate size and poorly proportioned ducts. The same size and type of fans and ducts should be used interchangeably for blast steam or blast furnace apparatus, if adequate results are to be obtained.

Blast steam plants have valves for control so that one or more sections of the heating coils may be cut out as the weather conditions permit. With adequate fan capacity, speed regulation, and properly arranged compressor dampers above the furnaces, which are grouped one or more may be cut out and not fired—sufficient air for ventilation being forced at an increased velocity through the casings of those in use.

Blast steam plants are almost universally equipped with automatic regula-

- All furnace fan systems in large buildings are subject to the objections to steam plan No. 1 previously described. It is doubtful if adequate furnace fan systems can be installed more economically than equal steam systems in buildings containing over twelve class rooms. For smaller buildings the horizontal pipes are usually not so long, but that some gravity circulation is in effect when the fans are not running. The toilet rooms may profitably be protected from freezing by very small auxiliary direct hot water or steam plants, the fires in which are never permitted to go out in freezing weather.

Fan furnace plants along the lines herein outlined will give very good results as to efficiency and economy. Very many of these heating systems will be installed. I ask for them more study and engineering skill than they have had in the past. The field for improvement is almost unexplored.



tion. Blast furnace plants may be controlled with equal facility and tempered air be secured for cooling the rooms without difficulty by using dampers in the plenum chamber decks.

Different Fuels Used.

For hard coal great fire-box capacity and shaking and dumping grates are imperative. Apparently the weight of the furnace is not as vital as its coal storage capacity. For soft coal, however, the furnace must have great weight of metal to store to some extent the heat from the quickly flashing combustible, and to prevent the rapid changes in temperature of the building in effect when soft coal is burned in a light weight furnace.

The internal combustion engine is rapidly supplanting the steam engine. It may well be that we will see the day when the direct acting air heater shall supplant the steam boiler and coils.

I have attempted briefly to describe the simplest steam plant, with its nearest parallel, the most complicated furnace plant.

Apparently they are growing nearer together, and we may hope that the best apparatus of the future will combine the merits of the two types without any of their faults.

Toronto's June building permits were \$1,055,405, as against \$1,445,230 a year ago. The permits numbered 2,605, against 2,024 in June last year.

Why Science Should Be Observed

Prof. J. D. Hoffman Advances Strong Reasons Why Loose Methods Should Be Avoided — Address Delivered at the Niagara Falls Convention of Heating and Ventilating Engineers.

The science, if such it may be called, of heating and ventilating engineering, is one that is founded almost completely upon the laws of thermodynamics. It is not what one might call an exact science, but, in its rational design and application, the engineer may work with a reasonable degree of exactness. Most of the points of interest in the subject may be theoretically developed, yet, as in all branches of engineering design some parts require theory modified by good judgment and the personal equation of the designer. In such cases empirical data, found by tests upon similar apparatus, are not only good things to apply as checks, but at times are absolutely necessary because of the lack of any rational information on that part of the subject. Fortunately, such cases are the exception rather than the rule, for with the properly applied principles of thermodynamics there is scarcely any part of the subject which is not possible of rational solution. Because of the fact, however, that some features of the work are as yet empirical and not as definitely understood as they should be, this is no reason why those who instal heating and ventilating apparatus should disregard all laws and feel justified in instalng a job that is empirical in all its parts, and one which shows scarcely any of the earmarks of theoretical investigation. The time has surely come when it may be demanded of all men who instal such apparatus that they follow closely to fundamental principles and be prepared to furnish proof for any step taken in their work.

Letting of Contracts.

Contacts for heating and ventilating apparatus usually are let in one of the four following ways: (a) Some person, called for convenience the dealer contractor, draws up a rough layout of the work, guarantees to instal satisfactory apparatus for a stated amount of money, buys his apparatus from the manufacturer, instals it according to his own personal ideas, or according to the plans laid down by the manufacturers, and in a general way guarantees it to give good service; (b) a manufacturing firm draws up a plan and contracts to instal, for a stated amount of money, satisfactory apparatus, usually made by the same company, guaranteeing its successful operation; (c) a responsible engineer is retained, who draws up plans and specifications for the work, and,

upon competitive bids, the successful contractor instals the apparatus in accordance with these plans and specifications, the engineer being the judge of the quality of the work and materials; (d) a responsible engineer designs the system and assumes all the responsibility in its erection, looking toward a certain required output or result. Materials are purchased in the open market and installed to his satisfaction, and after completion, if the final tests are acceptable, the purchaser pays the bills and takes charge of the completed plant. The last method is not much used in heating and ventilating installation as yet, being confined largely to power and manufacturing plants where a certain definite output of finished material is desired, and will not be further discussed; methods (a) and (b) being applicable to small installations and (c) to larger and more important ones.

Residence Heating by Furnaces.

Of all the uncertain and rule-of-thumb instalations, probably the furnace heating of residences can claim the greatest share. Competition among the furnace manufacturers has been so great that we have the country flooded with furnaces ranging in quality from good to positively bad. In order to place the furnaces, it has been the desire, and this is a legitimate one, to simplify construction, to remove features not absolutely necessary, to cheapen manufacture, and in many cases to so rate the furnace that the claims could be realized only under the best conditions of instalation, such as would be expected under test conditions and not under conditions as found in average service. Of the above mentioned points, the last one should not obtain in any case, since a furnace should be so rated as to realize its claims even under somewhat unfavorable conditions and the other points should hold good only in so far as not to develop an inferior type of furnace.

In addition to what has been said about the furnace, it is also true that the furnace manufacturer has been so busy cheapening his product and placing orders that he has been selling to Smith, Jones and Brown to instal according to their own notions of engineering work, and has not had time to investigate the engineering reputation of Smith, Jones and Brown to see if they would probably bring credit to his firm, nor has he had time to keep his own fin-

ger upon the pulse of the job to see if the plant is working well after it is installed. This apparent indifference of the manufacturer to the final results is probably the greatest source of trouble, and is that which gives color to the public mind and decides the buyer against furnace heat, because, as he has some right to argue, "Furnace plants are usually installed so as to make them inferior and defective, consequently the system is in itself defective. It is fast becoming a fact that the correct furnace job is the exception rather than the rule, and some remedy should be applied very soon. The fault is not in the system. Furnace heating, if properly installed, is healthful, cheap and scientific. Neither can it be said that the fault all rests with the manufacturer. The purchaser is to a certain degree to blame, in that he is willing to let the contract to any one who cuts to the lowest price regardless of the quality of the man who takes the contract or of the apparatus which he represents. In certain localities it has become almost impossible for a man of reputation and integrity to obtain a contract, because he expects to live up to the "full intent and meaning" of the contract, and proposes to stay with his work until it is fully satisfactory, regardless of cost. Such a man usually presents an estimate that is sometimes considered high when compared to some others, but when the expense of changes and repairs is taken into account it would in many cases be the cheaper proposition.

It does seem unfortunate that there are men in the business who are in it exclusively for the dollars, and care little as to the results. If such men were held strictly to the satisfactory fulfillment of the contract, even though it were to the substitution of an entirely new system, there would be less careless and haphazard bidding, and part of the troubles at least would be remedied.

Where Architects Err.

Another phase of the heating business which is a frequent source of annoyance and error is the relation of the heating engineer or the contractor instalng such work to the architect. The house plans are usually made without the consideration of heating; the heating plans are then supposed to be made to fit the house plans. Now what the average architect does not know about the heating business would fill many books, but

his own private opinion of his own worth in such matters is highly satisfactory, and consequently there is set up a different viewpoint between the designer of the building and the designer of the heating apparatus, much to the discomfort of the latter and to the detriment of his work in many cases. To be just to both, the system of heat should be selected first and then allowances should be made in the building plans for its installation. This is no hardship to the architect, since many slight changes, any one of which would possibly be in favor of the heating engineer, may be made in his plans without causing any trouble. Some of these points may be mentioned as follows: The size and location of the chimney; the running of the cellar partition walls to accommodate the location of the furnace and the coal bin; the height of the basement ceiling to allow sufficient inclination of the leader pipes; the construction of the partition walls between the rooms to allow for riser pipes of sufficient size to heat large upstairs rooms; the planning of the walls to avoid horizontal runs of heat ducts in the second floor to reach a room otherwise inaccessible; and other points not necessary to mention.

All heating engineers know that the range of location of a furnace relative to the house plan is very limited, and that in many cases it is an absolute necessity, after the house plan is completed, to set the furnace out of this desired location, thus compromising the efficiency of the system; also, that the basement ceiling in many cases is so low that the leaders require to be run nearly horizontal, thus reducing the draft in them; also, that a 6-inch studded wall in many cases could easily have been substituted for the 4-inch, with little additional cost, and have improved the system immensely; also, that certain walls absolutely prohibit the running of stacks to the desired spot in the room, and that with a slight change, this could have been arranged without in any way injuring the architect's plans. Such in brief are some of the troubles that the conscientious heating engineer or contractor faces when he proposes to do his work after the building plans have received the O.K. of the architect.

Finally, however, the purchaser himself occasionally offers objections to the proper design of the system because of the desire to economize, although false economy it may prove to be in the end. Occasionally one hears the advice, "Don't heat the chamber rooms on the second floor very warm, because I like a cold sleeping room." Advice which, if heeded, would be good nine times in ten, but the tenth time when it is needed, it is needed badly, and the system and the man who installed it are both censured. How much better to have made the job

right at first and permit the owner to regulate the damper to suit his needs, even to closing it entirely. The only word that could be spoken against this way of doing things is because of the very small increase in first cost; on the other hand, the favorable comment would be: "A system that is correct and one that will heat if you want it to." Good advice to all men installing residence heating systems is, "Heat every room as though it were to be used as a living room, and let the owner regulate to suit his needs."

Heating by Hot Water and Steam.

Not so much can be said about the failures in hot water and steam systems, because, as a rule, they are planned with greater care and by men better qualified to do the work. However, of all the difficulties experienced in both systems, by far the greater part can be charged to the hot water work. This is to be expected, when one remembers how very small is the motive force causing circulation in the water and how easily this may be counteracted by small pipes, many short turns or improper laying. Short cut rules for proportioning radiation are, also, in too frequent use even by those well grounded in the subject, and from whom could be demanded a more rational course. Residence heating by hot water and steam is fairly well standardized, and if designed from fundamental laws and principles, and installed with care and good judgment, should in every case give good results. Some of the points wherein these systems give trouble are as follows: Chimneys too small; heater or boiler too small; heater or boiler too far from chimney; heater or boiler set too high, thus giving too little pitch to the main piping; mains too small, thus killing the flow of the water and steam, also bringing the water line of the boiler too near the level of the lowest radiation; radiation too small and improperly placed; and other minor points.

The architect is responsible for the location and capacity of the chimney, and, in a degree, to the location of the heater or boiler, for, as he plans the basement, the heating apparatus must be located to suit. Many chimneys are poorly located and are of improper size, and when the heater or boiler does not fire well the responsibility of the architect in the matter is seldom thought of, and the censure is placed upon the shoulders of the man who installed the heating apparatus. This feature of the work is where the heating engineer can do some missionary work in the line of architectural design. The other points mentioned are directly chargeable to the man who designs the heating system, and there is little excuse for his mistakes. All should know that the surface of mains and branches should be counted as radia-

tion surface, and that the efficiency of the heater or boiler is somewhat reduced after having been in service for a time. Because of this latter point, a selection would be made having a capacity about 25 per cent. greater than the total radiation found. When such a generator is properly set, all pipes in the system will have a satisfactory fall, the minimum height of circuit will be sufficient to cause a good circulation, and the pipes will be so proportioned and attached as to avoid short circuiting or water hammer. Too small mains on a steam system have a tendency to force the water on the return end back into the radiators and cause "flooding." All of the above points, and still others that might be named, will stand as a credit or discredit to the designer.

Heating Engineer and Contractor.

In installations calling for a large expenditure of money, the heating engineer is usually called in to draw up the plans and specifications, and the contract for purchasing and installing the same is usually given to a separate party. This has the advantage of obtaining the complete layout of the plant with the apparatus specified by a party who is in a position to give an unbiased opinion, and also the advantage of obtaining a low estimate on installation because of the competitive bids. This system seems to be a very satisfactory one, all things considered, and probably gives the best results to the purchaser. It is not, however, entirely free from abuses. It is assumed that the party retained to do the engineering work will do his work conscientiously and scientifically, and that when done each part will correlate to the other parts and all will work in harmony and without loss of efficiency. This means that the designer himself should understand his subject and should be able at any time to give facts and figures on every part of the work. He should also have his plans and specifications complete in all parts and stated in plain and definite language, so that the contractor will understand every part and not be compelled to assume conditions which in the end may be erroneous. No uncertainty should enter into any part of the contractor's work, either as to quality and make of materials, or as to the way in which such materials are to be installed. Of course, there are many features of the work which may be left open to the discretion of the contractor, and these should not be arbitrarily stated. Such parts as the smaller details of the piping system, for example, where the cutting of the various parts may not in the least affect the efficiency of the plant, and where purposely omitting the same in the specifications and plans will give some latitude and satisfaction to the contractor in his work. These and other minor points are best

not specified. The great trouble, however, with plans and specifications is not as to their exactness even to every little unnecessary detail, but as to the lack of exactness concerning important points. When the contractor may reasonably make more than one interpretation of any certain part, it is naturally to his interest to take such view of the case as will carry out the letter of the contract at the least possible expense. This may not be to the best interest of the purchaser, but such procedure should not be wholly charged to the contractor.

Should Check Results.

The final word of caution that this paper wishes to extend probably does not apply to any member of this organization, but it does apply in many cases to men in like occupations with yourself. The keynote is struck in the preceding paragraph and may be paraphrased in the following: "The engineer attacking any important problem should first become thoroughly familiar with the principles involved in its solution, and should afterwards check his results wherever possible." This point was emphasized to the writer in a test recently run upon a heating and ventilating plant in a certain building used for auditorium purposes. The trouble in this plant seemed to be not the one usually found—i.e., cutting of parts to a minimum size and capacity—but rather the reverse will be seen by only one item out of a number which might be used for the benefit of illustration. The auditorium, which was exposed on two sides, contained 225,692 cubic feet of volume, and was designed to accommodate 1,350 persons, thus requiring, we will say, a total of 2,430,000 cubic feet of fresh air per hour. Allowing the outside temperature to be zero and the temperature of the auditorium air to be 65 degrees F., the total heat loss, including that thrown away with the air, was found to be by calculation 3,072,875 B. T. U. per hour, which gave by calculation 2,375 square feet, or 7,125 lineal feet, of one-inch coil surface in the indirect heater. When the coil surface was measured after the test, it was found to contain 14,612 lineal feet, or a little more than twice the calculated amount. One reason for the test was the fact that a large part of the coil surface had been shut off soon after installation and never used afterward, and it was supposed that the system was not well proportioned. Other parts of the plant also seem to show the same lack of rational design.

What has just been stated concerning this one plant is true of too many plants about the country. If the business we represent is to rank high among other lines of engineering work, it is the duty of every man to discourage such methods and insist upon a higher standard.

Requirement of Traps for Each Fixture Waste

Address by I. A. Lederer, Inspector of Plumbing, Bloomington, Ill., Before the American Society of Plumbing and Sanitary Inspectors.

I recently had a conversation with a leading master plumber of my city, who had the contract to instal a battery of eight lavatories and asked my permission to allow him to connect the different waste outlets to one common trap. This I refused to do, whereupon he referred me to the architect who had the work in charge and to his specification. I consented as a matter of form and took up the matter with the architect and he referred me to the catalogue of a manufacturer wherein was illustrated the same battery and connected to one trap. Now you know there are good plumbers, good architects and good manufacturers, all with a good intent, consequently it was up to the plumbing inspector. I have now gone on record as being partial to separately trapping each and every fixture waste and make no exceptions.

One Trap for a Battery Insanitary.

This little incident indicates that there are some interested persons who think it proper to allow one trap, common to more than one fixture waste. It appeals to them for some reason. But why? Is it from a sanitary point of view? Let us see, and keep this question on our

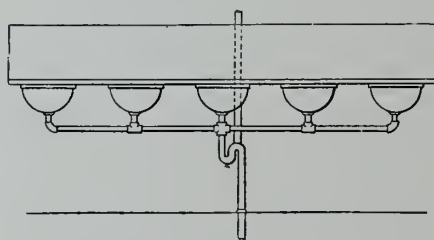


Fig. 1—Battery Served by One Trap.

minds as we now touch on the subject proper, and since I have brought up the lavatory—and as this seems to be the most absurd fixture when installed in batteries—I shall use it for demonstrating the one trap proposition. We will now take five lavatories installed in batteries, the trap centrally located—that is, beneath the middle lavatory, the outlet of which is connected to the one trap through a cross that also opens to the right and left to receive the outlets of the two remaining lavatories on either side, so that the waste or unclean water must travel from either side to the centre before it can be delivered to the sewer beyond the trap seal.

We now have the five waste outlets of these lavatories connected to one trap and all above the water seal, leaving an open path connecting each fixture. Now, taking the law of gravitation into con-

sideration, we have a volume of air in motion, descending in one of the outlets and rising in another, its velocity depending on the difference in temperature, air currents that disturb and carry along with them, to be expelled into the room and inhaled by the occupant, all odors, gases, germs, etc., that may arise from decomposed or fermented matter collecting from time to time in this exposed pipe, which (according to the size of the lavatory) would be from 2 to 6 and 8 feet in length. Now, as this exposed waste pipe usually has but little fall toward its outlet, the trap, whether the trap be in the centre or at one end, and this is particularly true in cases where the plumber does not use due care in hanking the lavatory allowing one to vary in height from its companion, permitting the unclean water when wasted to run back into the waste of the other, throwing the solid matter contained to the top of the pipe, where it often remains to decay, owing to the inability of flushing the entire bore of the pipe caused by the uncertain quantity of water used in the basin from time to time.

Right here let me relate an incident in which this same waste pipe as described was the offender and my humble self the victim. I had occasion to make use of one of the lavatories that had been installed in the washroom of a large hotel, in batteries of five, and as the end ones were engaged I stepped toward the centre one and proceeded to stoop over to insert the basin plug, when the party using the end basin pulled its plug to allow the discharge of the used water. Now, had I no knowledge of plumbing I would have suspicioned at once that the lavatory had been put to improper use, for the odor that belched out of that remaining open basin, due to the sudden rush of water acting as a plunger, seemed to me a worse gas than sulphuretted hydrogen, ammonia or carbonic acid in separate or combined doses. Probably this was on account of having received the entire benefit, but one of the occupants also remarked that he thought the room needed ventilation.

Obstructions in Traps.

I took a quick glance underneath the lavatories and saw at once that my enemy, the battery trap, was responsible for the mischief done. Since that time my doubts were strengthened regarding one trap working overtime to accommodate a good many abused waste outlets. Should there be a simultaneous discharge from these lavatories, which is possible,

the movement of the water would be sluggish owing to the fact that we have five outlets discharging in most cases into one opening of equal size to one outlet. Now, if we have any waste pipe to spare let us put it on the sewer side of the trap seal and not on the house side, so we will get the unclean water beyond the trap seal as quick as we can and give the trap a chance to guard us against injurious gases for which it is constructed. But in order to do so it also becomes necessary to connect it to each fixture as closely as possible, and far better be it to house it within or let it become a part of the fixture itself.

Fully 50 per cent. of the stoppages or obstructions in waste pipes can be traced to the traps, and especially is this so in traps located any distance from the fixture proper. This has been my experience, but we will only assume it is true and say that when our battery trap stops up it puts the entire washroom out of commission, causing great inconvenience until we are able to remove the stoppage. Now, if each lavatory were separately trapped at the trap we will find the stoppage.

You who do not coincide with me might say the more traps the more stoppages, but permit me to reply that this would not happen at the same time. It is next to impossible to put them all out of business at the same time when separately trapped, for they are not used alike, consequently you have a lavatory at your service at all times. And is it not better to take chances on one basin standing with foul water in case of stoppage to pollute the air than it is with five or more?

Outlets Below Water Seal.

There is now another connection to consider besides the open path method—as I term it—of connecting more than one fixture to a single trap, and that is to connect the outlets below the water seal of this one trap. But in order to make this possible we must have a large trap capable of a deep seal. We will now suppose that all openings from the lavatories are sealed against sewer gas, and we have thereby eliminated the possibilities of any air circulating between fixture wastes at distant points. We might go so far as to say that the conditions now are as good and as reliable as if we had a separate trap for each fixture waste. This sounds good, does it not? But have we decreased that sluggish motion? Have we increased the outlet in size so it might conform to the combined area of its branches? Have we placed the waste pipe on the right side of the trap so it will quickly deliver its contents to the sewer beyond the trap seal? And last, but not least, have we protected one fixture from the other in cases of stoppage in our battery trap? I cannot see where we have bettered con-

ditions, consequently I remain an advocate of separately trapping each and every fixture waste; and let me again add that I make no exceptions from this rule. These are my views at the present time, but I am not so narrow minded that I could not accept the battery trap providing a more enlightened mind upsets my argument.

In taking a journeyman plumber's examination some years ago, the board asked me, along with other questions, "When is it permissible to use one trap for more than one fixture?" I did not know whether this question originated with the board, or whether some individual was authority to the extent that there were occasions where one trap might serve two fixtures. I nevertheless took exceptions to the question and gave my answer then, as I am giving it to-day. I was told by the board that I had answered it wrong; that when laundry trays and sink were set side by side one trap might serve both. This was nearly 12 years ago, and to this day this question seems unsettled. Will it be settled

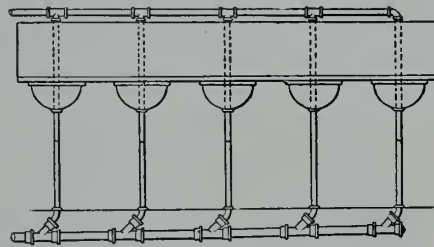


Fig. 2—Separately Trapped and Vented.

by this meeting, or will enough light be thrown on the subject to warrant at least a majority aye or nay, and thereby give the plumbing inspector something definite to work on and also make a comparison of ordinances governing plumbing in our cities a possibility?

WHAT CONSTITUTES A PLUMBING FIXTURE?

The question was raised at the annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, as to what constituted a plumbing fixture, and it was discussed by the members as follows:

Edward Quinn, St. Louis—I would like to ask just what is meant by a plumbing fixture? Suppose I had ten bowls in a row with one connection, and I went into any court of record to fight a case relative to a separate fixture, do you mean to say that you could stand up and say that that is a separate fixture and you need a separate trap under each one of those bowls? You could not do it for the simple reason it is made all in one piece. I would like to hear somebody who has had trouble along that line discuss that matter. Take a row of basins 12 or 15 feet long, and what would you

consider that, one fixture or ten fixtures?

Chas. Ball, Chicago—It seems to me if you analyze what we mean by a plumbing fixture, you can get rid of Mr. Quinn's difficulty. A plumbing fixture implies a waste and a supply, and every one of the ten bowls has a waste and supply, therefore, each one of them—it doesn't make any difference whether you set them in a circle, in a battery or in what manner—is a separate fixture.

Mr. McVea—In regard to Mr. Quinn's remark, I will state that I have had experience in regard to that with the Union Pacific Railroad. I consulted the city attorney of Omaha in regard to that matter and he stated that an outlet for discharge defined a fixture. There were batteries of lavatories of about 175 bowls in washrooms where the mechanics and laborers wash up. Each and every bowl was a separate fixture. Of course a battery of closets with one outlet, no matter how many there were, is one fixture. Each and every fixture shall have a separate trap, so in our city if you have a three part laundry tray you must have three traps.

H. J. Luff—It might be interesting to the members to know how Mr. Eisenmann treated this proposition in the proposed Cleveland code. One thing that you must take into consideration is this: Most of the rules and regulations give you a maximum length of distance from the fixture to the trap, and that is ordinarily perhaps about 2 feet. I know in most of them it is so and he treated it this way: that a fixture of this kind, when a number of fixtures form one fixture, where one trap would serve for three openings, three bowls, provided the trap were placed under the centre bowl and the distance from that trap either way would not exceed the requirements in the code as to the distance from the fixture to the trap. It is manifestly proper that a distance of that kind must be used in one code as in the other. Then it is essentially correct that in the three part fixture the trap may be placed in the centre and the distance must not be to exceed that which is allowed for a single fixture.

Mr. Quinn—Last year, when I was in Cleveland, I happened to go into one of your barber shops there and I saw eight individual washstands set the distance between the chairs of the barber shop, and all drained into one trap in the centre that was not even ventilated, one block from your Hollenden Hotel.

Mr. Luff—You might find that existing at the present time. What I have stated, Mr. Quinn, was in reference to the proposed Cleveland code. I must confess that that is very bad practice.

Mr. Quinn—It seems to me that the definition of what one trap or one fixture is could be very well covered in your code.

Service Connections to Water Mains

John G. Grove, in the Plumbers' Trade Journal.

The plumbing work for a building begins in the street where taps are made in the water main and connections are made to the street sewers. Tapping of water mains is usually done by an employe of the water department so that very few plumbers are called upon to perform this work; however, it is as much plumbing work as is the setting of fixtures within the building and every plumber should be familiar with the method and requirements.

The first and most important work is to connect the corporation cock to the street main. This is done by means of a tapping machine which is clamped to the water pipe so that a hole can be drilled and a thread tapped in the pipe, the work being done in an enclosed compartment, while the pipe is filled with water and is under pressure. After the pipe has been drilled and tapped, the corporation cock, "A" (see cut), is screwed into the opening. The street main is then ready for the plumbers' connection. It will be noticed that the corporation cock is screwed into the top of the water main. In some cases, however, the tap is screwed in at an angle of 45 degrees from the horizontal, but never in good work is the connection made at the side of the pipe. There are, of course, good reasons for connecting the corporation cock on top of the street main. Should the main be heaved with frost, or settle in the earth, after the service connection has been made, there is less danger of the corporation cock becoming broken when it is located on top, than if it were at the side. Added to this reason is the further consideration that a main can more easily be tapped and the corporation cock more easily screwed into the top of the pipe than into the side.

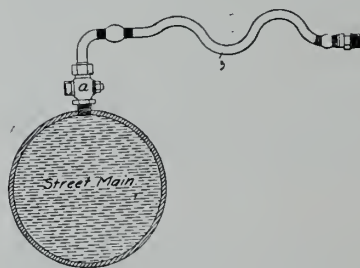
Driven Corporation Cocks.

In some cities where the water pressure is low, instead of screwed or threaded corporation cocks, the authorities in charge of the public water supply, use driven corporation cocks. Driven corporation cocks are similar in general constructive features to threaded corporation cocks, but differ in this respect, that driven corporation cocks have smooth surfaces instead of threaded and are made with a slight taper so that when a water main is drilled (but not tapped with a screw thread) the corporation cock can be driven in with a hammer until it is wedged firm and effects a water-tight joint. Driven corporation cocks are not as extensively used as are threaded corporation cocks for the good and sufficient reason that

they cannot be depended on to remain tight after they have been installed. A sudden jar of the service pipe when the trench is being filled, a subsequent upheaval of the service pipe by frost, or a settlement of the street mains, is liable to loosen the corporation cock, thus allowing it to leak. If the ground where the service is installed is of a loose, porous texture, the water will seep away without showing at the surface, and if many corporation cocks are leaking in that manner, a large quantity of water will be lost daily without any surface indications to show where the loss occurs.

Large Sizes in Special Cases.

The size of corporation cocks used is a consideration about which water companies are very particular. Most companies are very particular. Most companies have a certain size corporation cock, which they use generally, and a larger size which they will insert in spe-



Service Connection to Water Main.

cial cases. If the large corporation is not of sufficient size to supply the required amount of water, they will connect the service to several taps, or will cut the street main and insert a special branch fitting for the service pipe. The largest corporation commonly permitted by water companies is $\frac{3}{4}$ inch. As a rule, they object to a larger size, particularly on small mains, because on account of the curvature of the pipe, a sufficient number of full deep threads cannot be tapped to insure a tight joint. This is more particularly true of small pipes which have a small arc, than in large water mains of 24 to 36-inch diameters where much larger taps could safely be used. Corporation cocks of $\frac{1}{2}$ -inch, $\frac{5}{8}$ -inch and $\frac{3}{4}$ -inch diameters are the sizes commonly used in practice, the $\frac{3}{4}$ -inch being the largest generally permitted.

Corporation cocks are used for two reasons. In the first place, the use of a corporation cock at the street main permits the water to be shut off so the service pipe can easily be run, and in the

second place, by having a corporation cock at the main it brings the entire plumbing system under control so that in case of a leak on the street side of the first stop cock in the building, by digging down to the corporation cock, the water can be shut off while repairing the pipe. It further makes it possible for the water authorities to shut off water from any building without trespassing on the premises.

Brass Couplings.

There is a brass coupling called a tailpiece that goes with every corporation cock and this tailpiece can be had threaded for iron pipe or left plain for connecting to lead pipe by means of a wiped joint. The tailpiece is made water tight where it connects to the corporation cock by means of a gasket. While tailpieces are made with threaded ends for connection to iron pipe, it is bad practice to connect iron pipe or pipe of any other inflexible material direct to the tailpiece. Usually the trench in which the water pipe is laid is also used for the sewer pipe, which is at a lower level of the water main, and when the sewer trench is filled to the level of the water main, the water pipe is laid on the filled-in earth. If then, a rigid connection is made to the corporation cock, when the earth in the trench settles, as it is bound to do, something will have to give, for the weight of the earth above the pipe will bear down heavily upon it. To provide for just such contingencies, when the service pipe is of iron or brass, a short piece of lead pipe, as shown in the illustration, is interposed between the iron pipe and the corporation cock. This short piece of lead pipe, which should be $2\frac{1}{2}$ feet or longer, is usually made of extra strong or double extra-strong pipe, which is laid wavy to allow sufficient length for straightening out in case of a settlement of street main or service pipe. In some cities the water supply authorities require that the entire service pipe from street main to curb cock be made of lead.

Connections to gas mains are not made with the great care exercised in tapping water mains. The service connections to gas mains are usually made by drilling and tapping the gas main on the top, then screwing into this outlet a street ell into which a length of iron pipe is screwed without the intervention of a piece of lead pipe. The common use of an elbow and nipple, combined into one fitting, for this purpose, is what gives to that class of fitting the name "street ell."

The plans prepared by Thornton Sharp, Vancouver, have been accepted for the new west side school to be erected at New Westminster.

NEWS OF THE TRADE IN CANADA

Joannette & Mathien, plumbers, Montreal, have assigned.

Tremblay & Francoeur, plumbers, Montreal, have been registered.

H. Lefrancois & Co., plumbers, Ahuntic, Que., have been registered.

Roy Johnston has joined the plumbing staff of E. B. Welsby, Guelph.

The premises of Geo. Chapple, plumber, Grand Forks, B.C., were damaged by fire.

E. B. Fewings, of the Galt Electric & Gas Fixture Co., has returned from a trip through the West.

One hundred and seven plumbing permits were issued in Regina during the first six months of the year.

Albert Wicks has opened up an electrical supplies establishment in Guelph, and has everything needed in this line.

Creditors are asking that the Niagara Falls Heating & Supply Company be wound up. Assets are \$20,827, and liabilities \$48,393.

The electricians of Guelph are kept busy erecting the lighting decorations for the Old Home Week. There are several extensive contracts.

All the Halifax plumbers are very busy this season. Building is quite brisk, and the plumbers have lots of work, something unusual for this season of the year.

Duncan Gordon, of Gordon & Egan, Montreal, has retired, and W. N. Morrison has taken his place with the firm, which will still be known as Gordon & Egan.

J. C. Wanless, Chatham, Ont., has just secured a large contract in Wallaceburg for plumbing and other work in the Tecumseh House. Work will be commenced at once.

J. E. McIllevy, has been appointed manager of the Vancouver branch of the Crane Co.'s business, he having been traveling salesman for the company on the coast for several years.

The annual picnic of the Plumbers' Union, No. 144, Montreal, will be held at Otterburn Park, on August 15. The committee is preparing a good programme of attractions.

J. Payne, recently with McLennan & McFeeley, Vancouver, has taken over the business of the North Vancouver Hardware Co., and has added plumbing and electrical fixtures to the business.

Westman Bros.' workmen have commenced preliminary work on the new heating system at the collegiate insti-

tute, at Chatham, Ont., for which they were awarded the contract on June 30.

The Western Heating & Plumbing Co., Saskatoon, has completed a job at the new King Edward pool and bath rooms. A number of tubs have been installed with sprays. The rooms have also been fitted with closets and lavatories.

John Reginald Watson, young son of John Watson, Montreal, president of the National Association of Master Plumbers, is dead from pneumonia, following an attack of typhoid fever, at the age of 17. He was buried at Mount Royal Cemetery on Friday, July 24.

R. G. Struthers, Galt, who recently purchased Galt Electric-Gas Fixtures, Limited, has sold the plumbing part of the business to Ross & Short, and the fixture business and electrical supplies department will be carried on under the name of the Galt Electric & Gas Fixture Co.

A couple of plumbers from Mahoney Bros., Guelph, were at work in a residence on Paisley Street last week, when a gas pipe broke and ignited at the plumbers' torch. As the break was near the meter it was impossible to shut it off on account of the heat, and a fire alarm was sent in. No damage was done.

Plumbers and Fitters' Lodge, No. 67, Hamilton, held their annual picnic at Nash's Grove on July 18. It was a success in every way. The fitters defeated the plumbers in a fast game of baseball by a score of 15 to 10. The plumbers got their revenge later, when in a tug-of-war they pulled the fitters all over the grove.

The contract for the installation of a boiler at the Central School, Chatham, Ont., for the purpose of generating steam for the heating system, has been awarded to Park Bros., their tender for boiler and equipment being \$2,625. In this, as in the case of the collegiate institute heating system, the time for receiving tenders was several times extended.

F. J. R. McPherson & Co., Peterboro, have been awarded the contract for plumbing, heating, installing, of the Buffalo forge system of ventilating, and wiring in a new \$60,000 school to be erected at Belleville. The work will begin in a short time. The same firm has the contract for the plumbing and heating apparatus in a large Stirling residence, and it has just begun operations on the plumbing work in the new armories in Peterboro.

C. Walsh, of the Western Plumbing, Tinsmithing & Heating Co., Lethbridge,

was out to Harry Bredin's ranch on the Big Bow River, northeast of Lethbridge, installing a very ingenious water filter at the ranch. It resembles a gigantic screw covered in, laying at an angle on the bank and set revolving by means of gearing connected with a windmill. The lower end sets in the river and the revolving motion forces the water up the spiral tube to the height required.

It appears that the Canadian Brass Works will not be reorganized. For a short time after the assignment the factory was run under the London Loan & Trusts Company, but recently all operations have ceased. The closing of the factory will mean a distinct loss to Galt. It is understood that the firm was rushed with orders, but that lack of ready money led to the suspension. It is remotely possible that operations will be resumed, but the consensus of opinion is to the effect that the industry will be abandoned. The town which loaned the company \$15,000 has a first mortgage on the building and plant, and, therefore, does not stand to lose.

Jos. Laurier, Montreal, vice-president of the National Association of Master Plumbers, and also the vice-president of the Montreal one, is an extremely busy man these days. He has in hand the plumbing for the Salaberry School, one of the most important structures now being erected in Montreal, and also the plumbing for the Convent of the Sisters of Notre Dame. He is also doing work on eight large private houses. He has just finished the Dignard Biscuit Manufacturing Co.'s building. Mr. Laurier has also secured two important contracts from the Montreal Corporation, and for a fire station, the whole running into thousands of dollars.

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.

President—John Watson, Montreal.

Vice-President—Joseph Laurier, Montreal.

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Apprenticeship—J. A. Thibeault, Montreal.

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Essay—G. A. Wooten, Halifax.

Organization—R. J. McCauley, Montreal.

CONTRACTS AND BUSINESS OPPORTUNITIES

General Building Notes.

Jos. Power will erect a \$20,000 warehouse in Toronto.

J. J. Walsh, Toronto, will spend \$10,000 on new residences.

Building permits at Halifax for June totalled about \$54,000.

The Merchants Bank will erect a branch at Medicine Hat.

A \$25,000 block will be built on Westminster Ave., Vancouver.

A \$16,000 building is to be erected on Seymour St., Vancouver.

Clair McKenzie will erect a Burns memorial hall at St. John, N.B.

A new bank building to cost \$8,000 will be erected at Belmont, Man.

P. Hogan, Peterboro, is erecting two stores next to his hotel in East City.

The New Y.M.C.A. building at Woodstock, Ont., will be ready in September.

Vancouver's building permits for the first week of July were valued at \$27,000.

C. G. Eadie, Montreal, has been granted a permit for a residence to cost \$10,000.

K. Chadwick will erect an apartment house at an estimated cost of \$20,000 at Toronto.

M. J. O'Brien will build a new hotel and possibly an opera house at Renfrew next spring.

Baynes & Hoile have the contract for a three-storey flat block on Granville Street, Vancouver.

Atkinson & Hall, Seattle, have the contract for the new \$22,000 Drost Block, Vancouver.

Lumsden, Sask., reports a briskness in building, 21 structures, valued at \$86,000 now going up.

A large number of building permits have been issued, showing that building in Preston will be brisk this summer.

Thirty building permits valued at \$75,310 were issued at Regina during June, including the \$30,000 Separate School.

The Y. M. C. A. building, St. John, N.B., is rapidly nearing completion and will probably be ready for occupancy early in September.

Vancouver's building permits for the first six months of the year represented an expenditure of \$3351,550, an advance of 50 per cent. over the same period a year ago.

Perdue, Sask., is showing building activity. Besides other buildings, two stores have been commenced and a three-storey hotel. The contractor for the latter is W. May.

A fire at Perth Junction, N.B., on July 7 destroyed Dionne's Hotel and the combined store and dwelling owned by Mrs. Mallory. The loss is about \$8,000, with insurance less than half.

William McKay, President of the London & Lancashire Life Assurance Company, is reported to have forwarded to London a recommendation in favor of erecting in Winnipeg a seven-storey office building.

Toronto University authorities have approved of the erection of a \$100,000 thermo-dynamics building; the enlargement of Worthington House, \$21,000, and renewal of dining hall and kitchen, \$6,000.

Recent building permits in Hamilton include: Stewart & Witton, church building, \$11,000; addition to A. M. Souter's store, \$4,000; W. Kerr, two houses, \$3,600; Mrs. Ann Gould, store, \$4,000.

It is some time since so many new buildings have been in course of erection in Sussex, N.B., as this summer. The Sussex Manufacturing Co. are erecting five houses. Ten are being built by private parties. A large addition is being built to Church Avenue Baptist Church.

The Dominion Government has voted \$10,665,721 for public works throughout the country, mostly for public buildings. These latter total 209, divided as follows: Quebec, 50; Ontario, 82; New Brunswick, 10; Manitoba, 12; Nova Scotia, 15; Saskatchewan and Alberta, 20; British Columbia, 17; Prince Edward Island, 1.

The King Edward Hotel, Saskatoon, is undergoing considerable alterations this week. Room has been made for closets, lavatories and urinals in the rear of the public room. Upstairs a bath room has been fitted with up-to-date appliances. The basement has also been considerably altered and made into sample rooms.

Building permits at Prince Albert for last month amounted to about \$25,000. More activity is now shown in the building line, especially in dwelling houses. While the list will not be so extensive as it was last year the situation improves as the season advances. The High School, St. Alban's School, and the Hudson's Bay stores are amongst the largest on the programme so far.

Building is still proceeding apace at Vancouver. For the first week in July, \$35,000 worth of permits for what might be called the smaller buildings the cost of which do not exceed \$5,000, were issued. Excavation has been started for two large blocks on Pender Street on

diagonal corners, while on another corner at the same location, the B.C. Permanent has two storeys up of a large office structure. The Vancouver General Hospital proposes the erection of a wing to cost \$18,000, and a new nurses' home, to cost \$15,000, is being contracted for. The Bank of Hamilton is erecting a three-storey building on Powell Street that will have a frontage of 125 feet. These are only the newer buildings.

Waterworks and Sewerage.

New sewers are being constructed in Perth, Ont.

A sewerage system is suggested for Kincardine, Ont.

A number of water pipes are being laid at Saskatoon.

Work on Sherbrooke's waterworks system is progressing.

Melita, Man., proposes establishing a \$3,000 water supply system.

A number of water mains were ordered to be laid in Vancouver.

A waterworks system to cost \$38,000 will be installed at Chesley, Ont.

A satisfactory test was made at Palmerston of the new waterworks.

Work is being pushed on Guelph's new \$120,000 waterworks system.

Many new hydrants and water mains are being constructed in Queen's Park, London.

Waterloo's new \$30,000 sewage disposal plant has been completed and is now in operation.

The tunnel under the bay, in connection with Toronto's waterworks system, is now practically open.

Lindsay, Ont., is considering spending \$10,000 for waterworks purposes. The Ozone Filtration System will be given a trial.

The ratepayers of Fort William will on Aug. 5 vote on a by-law to spend \$95,000 on improving and extending the waterworks system.

Regina ratepayers will vote on a by-law on July 30 to raise \$250,000 for sewerage extensions and \$50,000 for waterworks extensions.

At a meeting of the St. John, N.B., Water and Sewerage Board tenders for supplies for the department for the ensuing year were recommended to the Common Council as follows: 100 service stop cocks, James Robertson & Co., Ltd., 90c each; 300 cast iron stop cock boxes, Union Foundry & Machine Works, \$1.95 each; 50 main top cock vault tops, J. E. Wilson, Ltd., \$7.15 each; 60 catch-basin frames, T. McAvity & Sons, \$2.84 each; 100 cast iron sewer manhole tops, J. E. Wilson, Ltd., \$6.70 each; 20 tons special castings, Union Foundry & Machine Works, 4c a pound.

Public Buildings.

A new school will be erected at Port Arthur.

A four-room school will be erected at Morris, Man.

Bradford, Ont., will build a new schoolhouse.

At St. Johns, Que., military buildings costing \$17,500 will be built.

On Montreal's customs house \$5,000 will be spent on improvements.

A large new Collegiate Institute will be erected next year in Brantford.

Work is being pushed on St. Helen's new \$75,000 Catholic Church, Toronto.

Repairs costing \$50,000 will be made to the examining warehouse at Montreal.

A new school to replace the one destroyed by fire will be built at Bury, Que.

A new Public School and a Methodist Church are being erected at Lumsden, Sask.

The Broadway School, Woodstock, N.B., was totally destroyed by fire. Loss \$15,000.

At Pointe St. Charles, Que., a new sub-postal station to cost \$10,000 will be built.

Bloor Street Presbyterian Church, Toronto, will build a \$25,000 Sunday School.

W. W. Blair's plans for the \$10,000 school at Morris, Man., have been accepted.

A new Zion Evangelical Lutheran Church costing \$18,000 is being built at Stratford.

Tenders are called for the erection of a new \$10,000 Catholic Church at Vernon, B.C.

Tenders will soon be called for the erection of a new \$12,000 post office at Glencoe, Ont.

Additions and improvements costing \$9,000 are to be made to the Thistle Rink, Hamilton.

Another isolation hospital will possibly be erected at Crow's Island, near Moncton, N.B.

J. Studebaker has the contract for the \$3,800 addition to Chesterfield Ave. School, Vancouver.

Repairs are to be made to the school buildings at St. John, N.B., to the extent of \$13,488.75.

F. L. Dixon, Sydney, has been awarded the contract for the new Presbyterian Church at Inverness, N.S.

The roof girders for the Guelph Armory have arrived in that city and they will be erected immediately.

McDonald, Wilson & Snider have the contract for the \$95,000 extensions to the Vancouver general hospital.

The Board of Education have called for tenders for the erection of a new Collegiate Institute at Moose Jaw.

Property has been secured for the establishment of a Sister's Hospital and Catholic School at Grand Forks, B.C.

The M. E. Keefe Construction Co., Halifax, was awarded the contract for making the alterations at the Halifax post office.

The building committee of the Presbyterian Church, Hespeler, has decided upon the plans for the new church and it is likely that tenders will be called immediately.

W. W. Ely, representing the Pantages theatre circuit, has been negotiating for a site with a view to the erection of a new vaudeville theatre at Victoria at a cost of \$50,000.

Tenders have just been taken for the erection of school buildings at Collingwood Heights and Cedar Cottage, also for a four-roomed addition to the Mountain View School, South Vancouver.

The Halifax School Commissioners have just awarded contracts for two new school buildings at a total cost of \$96,372. The tenders of W. Harris & Son, Halifax, for both buildings, were accepted.

In the estimates brought down in the Federal House was an item of \$5,000 for the new post office at Fergus, Ont., which has been promised for some time. A \$5,000 post office is also promised for Mt. Forest.

The contract has been awarded to Newman Bros., St. Catharines, for the erection, at a cost of \$16,000, of the new administration building and superintendent's house at the Jordan Harbor Experimental Farm.

The by-law for the extension to the Winter Fair building, Guelph, was carried by 106 majority. The by-law was to grant \$10,000 to build an addition to the present structure and work will be commenced immediately.

The J. McDiarmid Co., Winnipeg, have been awarded the contract for building the new city hospital at Saskatoon. The price, which includes plumbing, heating, ventilating, etc., is \$47,495. The contract was let last year at a higher figure to another contractor, but the Hospital Board decided afterwards not to go on with the work then. The J. McDiarmid Co. are at present erecting the new post office at Saskatoon.

Howard Bridge. That gentleman has made a scientific study of filtration, and in speaking of this ozonization process, says:

Ozone is a colorless gas with a strong odor, and destroys many hydrogenated gaseous compounds; the combinations of hydrogen and sulphur, selenium, phosphorous, iodine, arsenic and antimony are thus affected. It decomposes many lodites in their solid and dissolved state, and discharges vegetable colors with like energy. Its many qualities were clearly set forth in an address given by the noted scientist Faraday before the Royal Society, but the real character of ozone was not known even to him at the time of his address. The neutralization of two opposite charges of electricity, known as electric discharge, produces a variety of effects when it takes place through a separating body of oxygen, or atmospheric body of oxygen, or atmospheric-chemical action which is sought, and the luminous, heating after effects are accidental.

By doubling the energy of the electricity the current of ozone was also doubled. In all ozonizers hitherto devised, the air is directed against, or around these cones of light made by the electricity in a plane, at right angles to them. It is a well-known fact that when electricity is discharged from a point, the surrounding particles of air are electrified, and, being of the same electrical sign, repulsion takes place, and the current of air, repelled from the point of a discharging electrical machine, may be felt by the hand. Mr. Bridge, in his system, has devised a perforated electrode, and it is so devised that the air passes through the perforation in fine streams, directly in the hollow of the cores of the discharges taking place at the surface. The air in the end is brought into intimate contact with the electrical discharge. Therefore we find that the air coming in contact with the electric energy produced by the two opposite forces becomes ozonized.

Now that the ozone is formed, the next thing to be considered is how the water is purified. The ozone system is guaranteed to kill all injurious germs and send the water through the mains to the taps sparkling and pure. The method causes a suction of the water under treatment to draw into itself the ozonized air required for its purification. By this system municipal water supplies can be sterilized at one-half the cost of the slow sand filtration which has never been known to absolve the whole of the bacteria.

Peterboro may also instal an ozone purification plant, should the system prove successful at Lindsay, and Mr. Bridge hopes Toronto to adopt the principle should the scheme work out well in the two before-named towns.

WATER PURIFICATION BY OZONE.

Lindsay, Ont., will give the ozone filtration scheme a test. This system, which is said to be very simple, is the invention of a United States citizen,

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, July 27.—Steady trade is being done by the supply houses. Orders while still on the light side are maintaining the stimulation in bulk noted in our previous issue, and inquiries are very promising. The opinion is generally expressed that there will be much building activity in the autumn. Inquiries by prospective buyers as to realty, the first step in the direction of an active market, are very numerous, and this combined with the effect of the good crop, and the fact the money is easier to loan, make the prospects very favorable. Jobbers anticipate a fine autumn trade as stocks in users' hands are light.

Plumbers continue to be uniformly busy. Some could do with more trade, but the majority have their time pretty well occupied. Some large contracts have been given out and several more are in view for the autumn. Outside work continues good, while jobbing orders maintain a steady level.

Prices generally are unchanged, with manufacturers in good shape for a steadily improving demand, although a sudden rush of orders might occasion some shortage.

Iron Pipe—Iron pipe continues to move well, some good orders being placed. Supplies are in fair shape, but considering the possibility of a heavy demand in the autumn, users with short stocks should not hang back too long, or they may have difficulty in getting material. Prices are unchanged.

Soil Pipe—There has been a good call for soil pipe, although just at present it is rather a slack time for this article. Inquiries point to heavier trade shortly. There is no change in prices and we continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

Lead Pipe—There has been a stimulation in lead pipe, some fair sized orders going through. We continue to quote: Pipe and waste are at 30, and traps and bends at 50 per cent.

Solder—Orders continue about the same volume. The demand continues good from the roofers. Prices are unchanged at 19c for half-and-half, and 18c for wiping.

Enamelware—Good activity is noticed in all lines. Producers find it difficult to cope with the orders now coming in as buildings started in the spring are now ready for this class of goods, and supply houses, through carrying low stocks, have to order heavily. Prices remain unchanged in the best class of goods.

Brass Goods—There is little feature to note. Standard lines are maintaining their prices under a steady demand.

Many cheap articles are still on the market, but the call diminishes as users realize the advantage of possessing the best material.

Radiators and Boilers—Better business has been done, and inquiries point to a good call shortly. We continue to quote radiators at 52½ off, and boilers at 50 and 10 off.

Metals—All the metals, with the exception of lead, have strengthened lately, although there has been no change in prices with the exception of tin. We quote. Ingot copper, \$14; ingot tin, \$32.50; lead, \$3.60; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10c; heavy lead, 2½c.

TORONTO.

Toronto, July 27.—Not much actual change has come over trade during the past fortnight and the conditions then prevailing have the same force now. Hopefulness was the keynote at last report, and this feeling has strengthened somewhat of late.

Prices remain as formerly, although there is a slight reduction on quantities of Fuller's No. 4½ bath cocks. The list price of \$2.10 remains, but if dozen lots of these are bought at a time there is a reduction of ten cents each made.

There was a rumor that brass taps generally had increased in price, but on investigation no foundation could be found for the inference, as manufacturers and jobbers continue to quote the old figures.

Fall inquiries are frequent and from present indications there will be not a little doing when buildings now erecting are further advanced. Naturally city business is much better than the country end, but for the past month it was surprising how the country business came to the front. It has dropped off again, due no doubt to the farmer being busy with other things just now.

Iron Pipe—Last quotations prices prevail—\$6.76 for 1-in. galvanized, and \$5.11 for 1-in. black. Cast iron fittings are unchanged at 65, and malleable fittings remain at 35 to 37½ off. Supplies fair and demand satisfactory.

Soil Pipe—Active demand and good supplies continue. Light pipe 60 and fittings 70, and medium and extra heavy pipe and fittings 70 per cent., are still the ruling quotations.

Lead Pipe—Unchanged prices prevail. Pipe and waste are at 30 and traps and bends are at 50 per cent. Calking lead runs from 4½c to 5c. Fair demand and supply.

Solder—Wiping is still at 18½c and half-and-half round 19c. Light business

is being done, though supplies are more than fair.

Brass Goods—This line is showing a slow but steady improvement. All quotations remain as at last issue. Fuller work 70, and compression work 65 per cent.

Enamelware—Old prices continue. The factories are busy turning out the ware, but demand is light.

Boilers and Radiators—After a busy late spring and early summer this line shows an easing off in demand. Prices remain unchanged and stocks are good.

MORRISON BRASS CO.'S OUTING.

The employees and friends of the James Morrison Brass Mfg. Co., Toronto, to the number of 500, journeyed on July 25 to Niagara Falls, on the 20th annual excursion of that concern. A series of games was held during the afternoon, and \$40 in prizes donated by the company were distributed to the winners.

A number of souvenir buttons, showing the trade-mark of the company, were distributed on the boat going across.

The firm supplied every one of its employees with tickets for the outing and bore all the expenses.

R. A. Morrison was chairman, and James E. Fiddes was secretary-treasurer of the committee looking after the arrangements.

PETERBORO SCHOOL PLUMBING CONTRACTS.

The committee appointed by the Peterboro Board of Education to inspect and investigate the plumbing in Queen Alexandra and King Edward Public Schools and the Collegiate Institute in that city, as a result of charges made by E. R. Stocker against C. A. J. Duranceau, reported at the last meeting of the Board. They found that the contracts had been substantially complied with, and W. Meadows, Toronto inspector, declared the workmanship good. The committee were satisfied that there was no defective plumbing, as alleged.

WALL CARD WORTH SAVING.

A neat and attractive wall hanger and fire alarm card is being supplied his customers by James Ellacott, plumber, 810 Yonge Street, Toronto. The centrepiece is a reproduction of one of Harrison Lister's crayon sketches, entitled "Madeline," and down both sides is set the signal box numbers of the Toronto fire alarm. Mr. Ellacott directs attention to himself by advising the reader in case of "fire" to ring the nearest fire alarm, but in case of "water" to ring up his shop. A simple border in brown and gold surrounds the whole.

NEW GOODS ON THE MARKET.

NEW WOOL FELT COVERING.

There has been placed on the market a new wool felt covering for low pressure steam and hot and cold water pipes. This covering, known as Morgan's Wool Felt Covering, is made in canvas jacketed sections, 36 inches in length, asbestos paper lined for low pressure steam and hot water, and tar paper lined for cold water. This covering is composed of successive layers of chemically treated wool felt. The sections are made three feet long, halved lengthwise, having a heavy canvas jacket and brass lacquered bands to hold it in place. Full particulars may be obtained from S. H. Morgan, 273 Jefferson Street, Detroit, Mich., the manufacturer of this new covering.

BURBANK THAWING MACHINE.

A new apparatus for thawing frozen pipes, water mains, sewers, etc., has been tested by several cities in Massachusetts and New Hampshire and towns in Maine and Vermont and has given satisfaction. This apparatus was the result of some years of experimenting on the part of E. A. Burbank, a master plumber of Berlin, N.H., who, having many cases of frozen pipes under ground to thaw, devised a crude apparatus that he has kept improving upon and adding to, until he got an apparatus that was so satisfactory, doing the work so easily and cheaply, that he had the apparatus patented in the United States and Canada, and now presents a practical working device which does the work quickly and economically.

Owing to its simple construction, it can be operated by workmen of ordinary intelligence, as anyone who can repair a broken pipe or do such work can operate the machine. While being built for hard usage, it is light, convenient and durable. The complete apparatus is about 28 inches long, 15 inches wide, and weighs about 125 pounds when fitted with 125 feet of 3-16-inch $2\frac{1}{4}$ ounce block tin coil. It consists of a force pump with air chamber, a coil heater and a reel, all fitted on a suitable base. Inside of the coil heater is placed a powerful gasoline burner, and the tank for supplying fuel to the burner is placed inside of the reel; the flexible coil being wound on the reel, making everything as compact as possible. Water as hot as can be used is forced through the coil heater and coil, and, when forced against the ice in a frozen pipe, will thaw it as fast as one can pass the pipe along. Two men, one to handle the pump and one to handle the flexible pipe, have thawed 10 feet of $\frac{3}{4}$ -inch pipe in one hour. Sewers and water mains have been opened with this apparatus when no other could do the work.

The apparatus is manufactured by the Burbank Thawing Machine Company, Berlin, N.H.

A WATER CLOSET VENTILATOR.

A meritorious device which has been placed on the market, is a closet ventilator which can be attached very easily to any closet. This ventilator, known as the "Peerless," automatically ventilates the closet bowl, and is claimed to prevent all odors from escaping into the room. It needs no attention, but promptly responds to the weight of a child. The instant its action begins a strong current of air is drawn downward from all around the top of the bowl and then out through the vent pipe, carrying all the gases with it. This is done by water pressure forcing the air upward in the pipe by a spray.

The Peerless ventilator when installed shows but little, is ornamental, improving the appearance of the closet. It is easily attached to any bowl, and is so simple in mechanism that it should require no repairs for years. The manufacturers of this device are the Peerless Ventilator Company, Buffalo, N.Y.

REDUCTION OF WASTE.

The Mueller Mfg. Co., Decatur, Ill., has put on the market a line of self-closing work to take care, mechanically, for shutting off the water. A strong phosphor bronze spring closes the cock or bibb against pressure, and by means of a tension screw the cock is made to operate against any pressure. It is operated by means of a set of three rollers on right and left spiral tracks, one of which is in the handle, and the other in the cap or bonnet. These rollers travel an equal distance and the wear is, therefore, the same on each one. This roller bearing feature is to reduce friction and make opening and closing easy. A sixth turn of the handle gives a full opening. A hexagonal nut above the handle screws on the stem and receives the force of the spring tension when the handle is turned in opening. The nut is also adjustable, admitting of taking up slight wear that may result from use.

CYCLOPS PIPE BENDER.

O. N. Beck, 11 Queen Victoria Street, London, E.C., are marketing the Cyclops pipe bender, which bends pipes up to 4 inches bore in one operation unloaded, up to 1 inch bore cold, or up to 4-inch bore in one heat. With the "Cyclops" pipes can be manipulated without any loading and even unskilled workmen can bend pipes in a perfect manner, much labor being saved by it, being unnecessary to insert or adjust bends or elbows. Another tool handled is the Universal pipe flanging expander, for at-

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions. Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word. Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in THE BOOKSELLER AND STATIONER, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, postera. The Hough Lithographing Co., Limited. Office, No. 3 Jarvis Street, Toronto, Telephone, Main 1576. Art, good workmanship, business methods.

THE BUSY MAN'S MAGAZINE is the most popular periodical of its kind. Why? Because each issue contains a strong list of original articles of interest to every Canadian. It also reproduces the most timely, instructive and interesting articles appearing in the other magazines and periodicals of the month. The cream of the world's periodical press is too valuable to overlook. BUSY MAN'S is on sale at all news-stands. Better still, send \$2 for one year's subscription. Mail it to-day. THE BUSY MAN'S MAGAZINE, Toronto.

AN EXTRA 1 PER CENT. PROFIT.—A National Cash Register will earn at least an extra 1 per cent. profit for any retail merchant. The National Cash Register Co., F. E. Mutton, Canadian Manager, 129 West King Street, Toronto, Ont.

REPRESENTATIVE WANTED.

WANTED in every town and village, a representative to take charge of the circulation of our various publications:—Hardware and Metal, Canadian Grocer, Financial Post, Plumber and Steamfitter, Dry Goods Review, Printer and Publisher, Bookseller and Stationer, Canadian Machinery, and Busy Man's Magazine. Good financial standing and business connection a strong recommendation. Just the position for a retired business man for his spare time. The MacLean Publishing Company, Limited, Toronto.

taching flanges to pipes without screwing, welding or brazing. By its aid pipes for the highest possible pressure may be flanged "on the job" by one man in ten to twenty minutes. It is also largely used in connecting up ammonia piping in cold storage and similar works. Descriptive literature will be sent on request.

SANITARY DEVICE FOR WATER CLOSETS.

A device known as the Cyclone Ventilator, which, when attached to a water closet, prevents the effluvia from excrement and all bad odors from escaping from the closet to the room, is being manufactured by the Sanitary Appliance Co., 216 Water Street, Neenah, Wis. To attach no change is needed in any closet. The manufacturers will answer inquiries.

A NEW INVENTION

Saves Money and May Save Lives

P. B. Bentley, of 70 Riverside St., Montreal has perfected a NEW HYDRANT which will be much sought by all the leading towns and cities of the Dominion.

Send for description of this wonderful invention. FULL DESCRIPTION OF IT GIVEN BY THIS PAPER.

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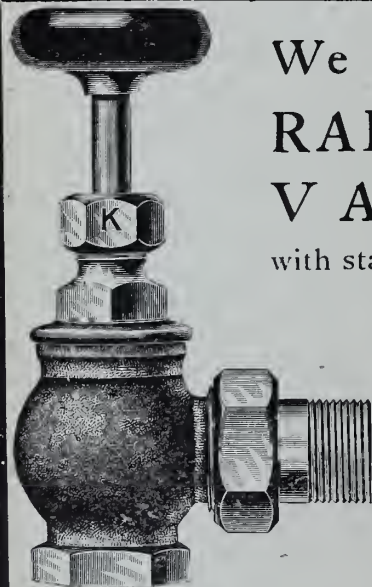


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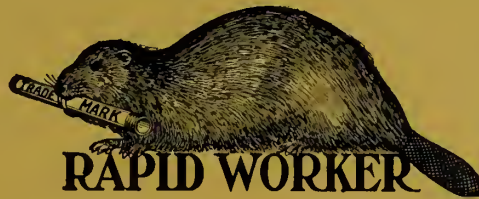
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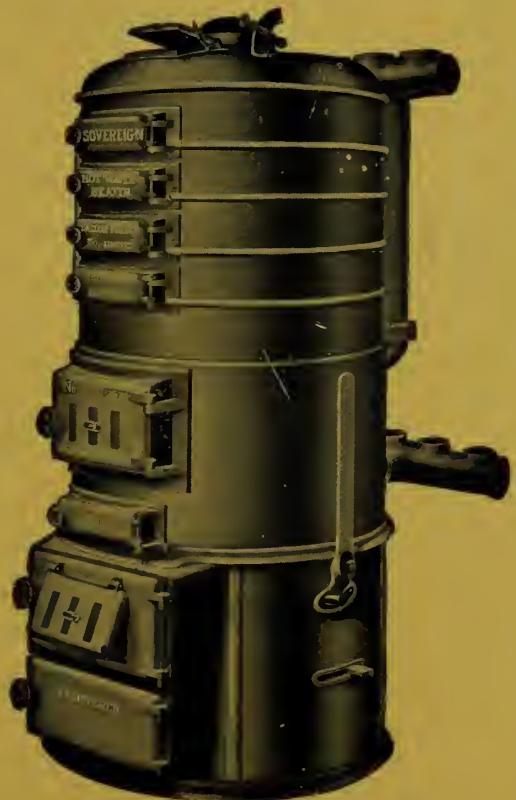
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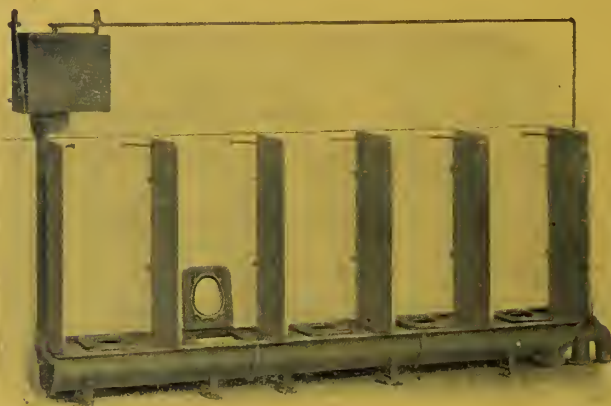
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TORONTO, 10 Front St. E.

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LONDON, ENG., 88 Fleet St. E.C.

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1908

DAISY

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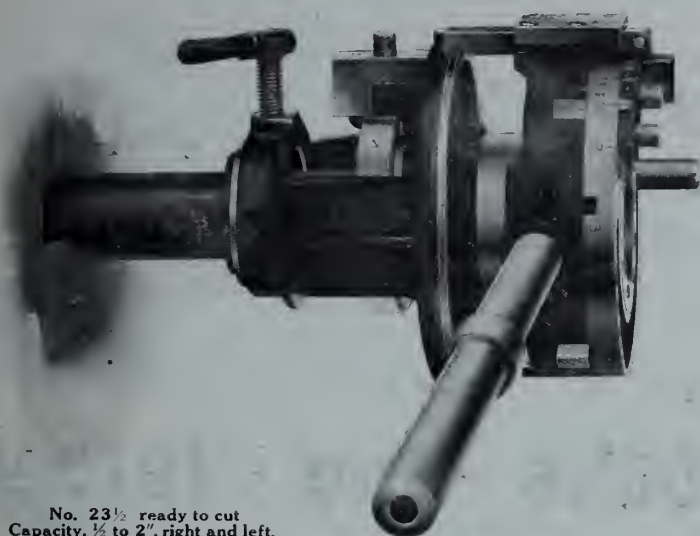
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And we've got this new steam boiler—and some other new heating goods to show you, that you ought to know about.

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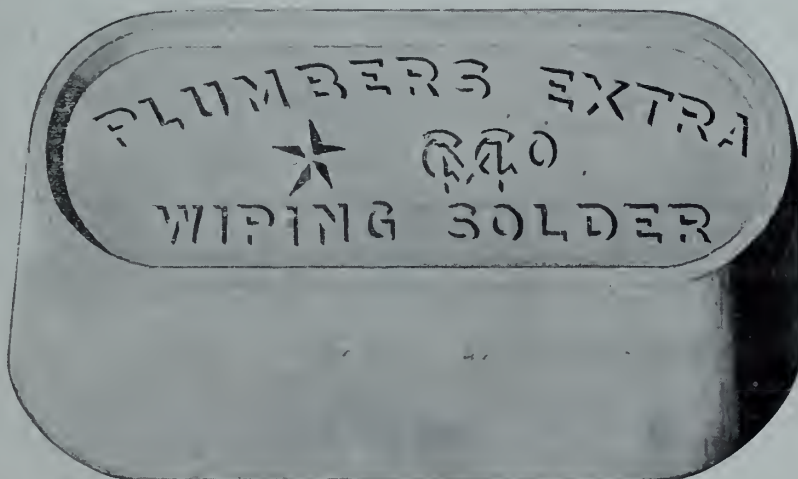
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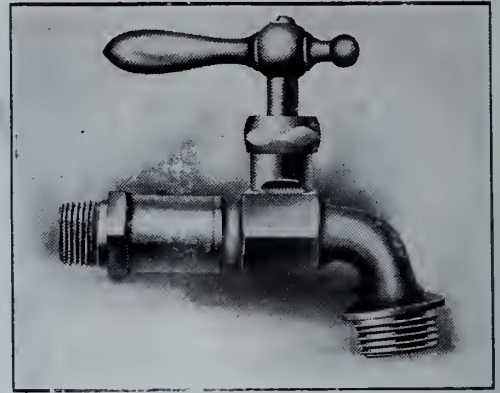
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The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



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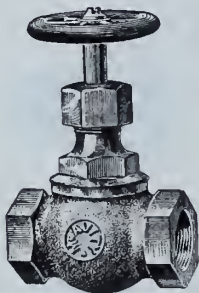


FIG. 2



FIG. 4.



FIG. 134.



FIG. 48.



FIG. 145.



FIG. 52.



FIG. 100.



FIG. 90.



FIG. 102.

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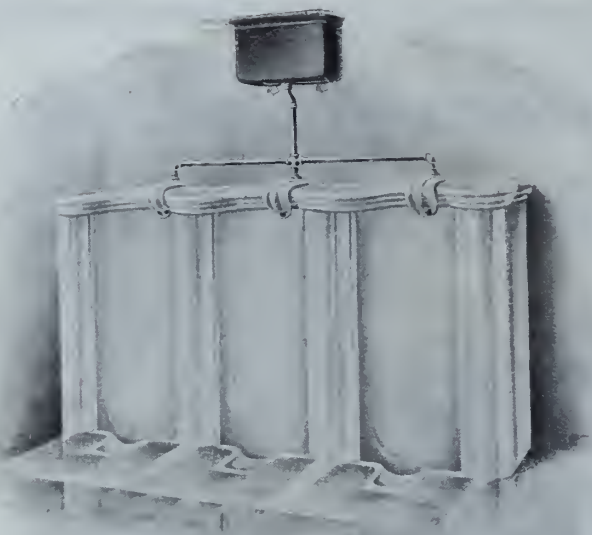
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C1201



C1203

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We also manufacture a full and complete line of porcelain bath tubs, lavatories, kitchen sinks, laundry tubs, slop sinks, hospital fixtures, etc.; also, a large line of vitreous Monument ware lavatories.

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The waterway is about one-third larger than any other wash down bowl made and is not contracted at any point.

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The Old Style Syphon Wash Down Bowl

**CONTRACTION
RESTRICTION**

B.O.T. Special

Plain Wash Down

Closet Combination



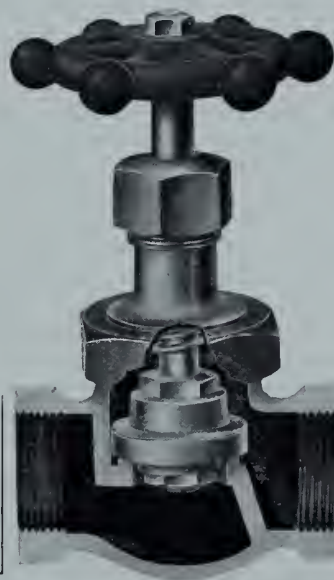
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Boards of Health, Architects, etc.

MONTREAL, TORONTO AND WINNIPEG, AUGUST 15, 1908

THE THIRTEENTH ANNUAL CONVENTION.

Organized in 1906 for the protection of trade interests, to encourage improvements and inventions in sanitary appliances and foster more advanced legislation to protect the public health, the National Association of Master Plumbers has a thirteen years' record of good work behind it and while the convention in Montreal last week was not so largely attended as previous gatherings, the convention was a success and good work was done by those who attended.

The trade disturbances in Toronto and other Ontario cities of a couple of years ago dealt the organized movement a severe blow and as President Watson said in his annual report, the National Association conventions have suffered during that time. There is every evidence of a coming change, however, and it is safe to predict that this year's office will have good reports to make at next year's convention.

It was freely predicted a couple of years ago that it would take almost a generation to get the trade in Toronto together again. The deplorable conditions brought about by unrestrained price-cutting, however, have already brought the trade together and the coming winter will see a boom in association work, not only in Toronto, but throughout Ontario as well. Harry Mahoney, of Guelph, says he can guarantee almost a score of outside delegates himself as soon as George Cooper, the Ontario vice-president, issues a call for the trade in Ontario to get together. The adoption of uniform regulations governing plumbing work in the larger cities throughout the province as well as provincial regulations dealing with the smaller places will provide plenty of work for a provincial association.

The convention at Montreal was more of an executive meeting of officers than a convention of delegates, no call being issued to the local associations to send representatives. Delegates were expected from Toronto, however, and much regret was expressed at the failure of the Queen City to be represented at either the 1907 or 1908 conventions. It was not known, of course that the delegate chosen to represent Toronto was prevented from attending owing to illness.

The present is a critical time in the history of the association and the Montreal association deserves the thanks of the trade for its generosity in again entertaining the convention and in stepping into the breach

at a time when too many who should be doing their part to maintain and strengthen the association are neglecting their duties. Let all who are really interested in the association extend a hearty support to the officers chosen to conduct the work during the coming year and when an officer writes a letter not only have the courtesy to answer but send an encouraging reply.

The good work commenced in Nova Scotia can be duplicated in other provinces if the officers in these districts have the energy and willingness to take up the work. And if, at this critical time, each officer puts his shoulder to the wheel and makes an effort to have something to report at the next convention, whether it be at Toronto or Halifax, the turning point will have been passed and the association will ride over the breakers on the crest of the incoming tide.

The Plumber and Steamfitter thanks the officers and delegates of the Montreal convention for the resolution adopted expressing appreciation for the work done by this paper in aiding the association work during the past year. The Plumber and Steamfitter has been loyally supported by the plumbing and heating trade throughout Canada and its subscription list is now practically complete, travelers telling us that it is seldom they find a shop without our paper, so thoroughly have our canvassers covered the field from Cape Breton to Vancouver Island.

To build up the paper we aim at is not the work of one or two years, but we are making progress and more of our readers are taking advantage of the opportunity of writing the editor regarding the problems met with by the men working at the trade throughout Canada. One firm at Kenora, for instance, writes complaining of a well-known heating firm supplying a hot water boiler to a grocer in that town, the job being done by a traveling tinker with no shop and the established fitter having to be called in to complete the job. Another firm at Cranbrook, B.C., writes questioning the figures supplied by Mr. Quinn as to the cost of constructing a septic tank. And still another plumber in Prince Edward Island forwards a query regarding back venting. With these questions to begin with in our next issue we trust the trade throughout Canada will keep our correspondence department a live and interesting one from this time forward.

Not only did the convention urge the master plumbers to send contributions to their trade paper but they also

called upon all friends of the association who are manufacturers or supply men to support this paper by placing their announcements on the advertising pages. The association officials realize that anything done to strengthen and uplift the trade is of material benefit to the manufacturers and supply houses and it is, therefore, to the advantage of every branch of the trade that the publishers be given every encouragement to improve the paper and make it as educational a factor as possible.

With the support, therefore, of all master plumbers and fitters who desire to see a better state of affairs than exists at present, every effort will be made to make the Plumber and Steamfitter a power for the good of the trade as a whole. Many of the most reliable houses selling to the trade are already aiding the Plumber and Steamfitter in its work and we commend them to our readers for a generous support.

NEEDS FOR ASSOCIATION WORK.

There is no trade, business or profession in which there is a greater need of good association work than there is in the plumbing and steamfitting world. Nothing can do more to raise the standard of work. Conference with fellow members in trade is bound to work good results and no possible harm can come of it when conducted along proper and reasonable lines.

More intimate contact is bound to produce more harmonious relations. Many men are despised and feared from a lack of actual acquaintance, but a close knowledge of them brings about a realization of their true ideas and real worth. Associations conducted on a proper basis will bring out means of conducting the work along better and more profitable lines. In too many cases the plumber and steamfitter is not deriving the recompense for his work to which he is justly entitled. Closer contact with his fellow man in the same trade permits him to point out where unsound methods are being followed, and at the same time the various phases of the business can be discussed in such way that there will be a general improvement along all lines.

Association along the lines of combination on a strict price basis is not true association, but is a false and unstable position that does not stand the test of reason and common sense and is against the good of public policy.

No two persons ever look at all questions from the same viewpoint and do not arrive at the same conclusions on all subjects, but intimate contact and conference with those interested in the same line of work is beneficial, as more ideas and hence better conclusions are brought about.

Being fellow members of the same association means a full recognition of each other's rights and works for a building-up policy instead of one of tearing down.

Your competitor is just as anxious as you are for better conditions, but as long as his interests and your interests are not reasonably well harmonized you cannot expect a betterment.

Through honest, reasonable association work the trade and the general public is sure to benefit. It means an uplifting of trade and the placing of it on a much higher plane. Better and more comprehensive plumbing regulations in every community are bound to be the result, which means a higher standard of protection to the general health. This once accomplished alone means better work and more of it. The public is the great gainer and the plumber is sure to receive his just recognition for his interest. The public fully informed of the great necessity of reasonable and just regulations means a greater demand for all kinds of plumbing material and

fixtures. To the plumber it means a field of work extended many fold by which not only he will be benefitted, but the entire community as well. This field can be broadened in no way so well, so fully, and so quickly as by united action through association work, and this cannot be accomplished at all through individual effort.

There are many seeming antagonizing interests that are to be considered, but these soon disappear under the condition that would exist under reasonable and wise association.

Talk this over with your competitors; get together and let us hear from you, as the columns of The Plumber and Steamfitter are open for a full and complete discussion of all matters of interest to the trade.

TEN PER CENT. PROFITS.

Through unnecessarily too keen competition profits in some lines have been reduced to too low a level.

Figured profits and real profits are too frequently quite two different items. One looks good on paper, but when the actual returns are looked into frequently the profit existed only in the imagination and not in reality.

Too much has been heard in the past of unprofitable work. Competition from inexperienced sources has many times led the experienced plumber and fitter to put prices at too low a level. This has been brought about by various causes.

Unprofitable work is quite often unsatisfactory to the person getting the work and is surely of no benefit to the party doing the work. It brings neither credit nor satisfaction.

Doing work without a reasonable profit is not founded on safe business principles. Frequently in the past we have heard of work being tendered for on a basis of a gross profit (on paper) of 10 per cent. above the actual calculated net cost of labor and material. No plumbing and steamfitting business that is expected to be maintained can reasonably expect to continue with such practice holding.

In the conduct of any business there are always expenses that are not directly chargeable to any one job that are a fixed charge on the business as a whole, and which vary according to the volume and other conditions of the business. Among these are rent, or taxes, interest, light, heat, office expense, stationery, postage, freights and various contingent expenses. All of these must be met first before any profit can even be considered to exist, and too often they have been neglected.

Just think for a moment that 10 per cent. on a \$3,000 contract, which may be considered a very nice sized job in the plumbing and fitting trade, is just \$300. Now, if you have a shop and office for which you are paying \$25 per month, or \$300 per year, it takes the entire figured profit on a \$3,000 job to pay the rent alone. What will pay all the other various expenses, without considering any cost for living?

Handling ten jobs a year on such a basis, or \$30,000 worth of work with \$3,000 figured profit would be more likely to produce a loss at the end of the year than a profit, after all expenses were paid.

Fair profits bring you credit, and is the only means by which you can ever expect to get a reasonable reward for your labors. It is the only way that you will be able to meet payments with reasonable promptness and maintain a stable and secure business standing.

Don't deceive yourself by taking your pay in glory, for the other fellow is getting something you are justly entitled to, and in the end does not thank you for. And it's just as much a crime to the trade to rob yourself as to rob some one else.

Master Plumbers' National Convention

Thirteenth Annual Gathering Held at the Birthplace of the Association—Owing to Trade Conditions Merely an Executive Meeting Held—Toronto and Halifax in the Running for Next Year's Convention—Officers Chosen for Coming Year.

With a grim determination to settle down to hard work and little play, delegates to the 13th annual convention of the National Association of Master Plumbers, Steam, Gas and Hot Water Fitters of the Dominion of Canada, assembled in Montreal on Thursday, Aug. 13. It will be remembered that Quebec was looked upon as the most likely place in which to hold the present convention, but it was found after due deliberation and a personal canvass of conditions in the Ancient Capital, that



JOHN WATSON, MONTREAL,
Retiring President of the Association.

it would not be convenient to hold the meetings there owing to the Tercentenary celebrations, and the difficulty of obtaining accommodation. Besides, it was considered that the festivities going on would not be conducive to business. Toronto was next considered as the most favorable meeting place, and The Plumber and Steamfitter of Canada worked hard to bring about the convention in that city. But the local association there was not in a forward enough state to see their way clear to invite the Association, and so it was decided to again visit Montreal, where the Association was born 13 years ago, and to transact the business in a city that held so many pleasant recollections for the delegates, and to work among colleagues that had given them such a hearty welcome the year previous.

This year's convention was not so representative as that of 1907, owing to reasons given by President Watson, but what it lacked in numbers it made up for in enthusiasm, and with the knowledge that only two days were to be devoted to convention work, no time was lost in getting through the business programme that was before the delegates. The proceedings were held in the Plumbers' Hall, 90 St. James Street, work, the Executive meeting was merged and for the purpose of accelerating into the ordinary session of the convention.

President John Watson, in opening the convention at 2.45, welcomed the delegates, and made the announcement that owing to the existing circumstances, with trade none too brisk, and reorganization in Toronto not in such an advanced state to warrant the meeting being held in the Queen City, the Executive had decided to make no attempt to secure a large attendance, preferring rather to have an extended Executive meeting where business rather than entertainment would be the chief aim. No invitations were therefore sent out to the various local associations throughout Canada, only the National officers and Provincial Vice-Presidents being asked to attend.

Practically the first business was a motion by J. E. Walsh, seconded by H. Mahoney, that the representatives of The Plumber and Steamfitter of Canada, and the Plumbers' Trade Journal, New York, be given the privileges of the Association during the convention. This was heartily carried, and the meeting settled down to hard, routine work.

Walter Ryan, Montreal, was appointed Sergeant-at-Arms, and L. J. Conroy, Chairman; J. A. Gordon and Harry Munday were appointed the Credential Committee. J. E. Walsh, F. Dexter and J. Laurier were appointed the Resolutions Committee.

Officers and Delegates Present.

The following were accredited as delegates to the convention: John Watson, Montreal, President; J. Laurier, Montreal, Vice-President; H. A. Knox, Ottawa, Secretary; F. Dexter, Truro, Provincial Vice-President, Nova Scotia; J. E. Walsh, Montreal, Provincial Vice-President, Quebec, while the following were chosen to represent by proxy the

Provincial Vice-Presidents for Manitoba, Alberta and Saskatchewan, Ontario, New Brunswick and British Columbia; P. C. Ogilvie, W. Ryan, Harry Mahoney, J. A. Thibeault and H. W. Munday, respectively.

The Montreal Association's delegates were: H. W. Munday, L. J. Conroy, James Griffin, J. A. Gordon and M. David, with Walter Ryan, Joseph Laurier, John Whitty, P. C. Ogilvie and J. A. Thibeault present as alternates.

The Plumber and Steamfitter of Canada was represented by Weston Wrigley, Toronto, and F. J. Arrowsmith,



JOHN A. GORDON, MONTREAL,
Elected President for the Coming Year.

Montreal, and the Plumbers' Trade Journal, by F. H. O'Connor, jr., New York.

Representatives of Supply Houses.

Amongst the manufacturers and supply house representatives noticed during the convention were:

Taylor-Forbes Co., Montreal—John M. Taylor, R. I. McLaren and Emil Dansereau.

Gurney-Massey Co., Montreal—R. J. Lockhart.

Warden, King & Son, Montreal—Louis Payette.

Dominion Radiator Co., Montreal—J. B. Morris, F. Rawley and E. P. Matte.

James Robertson Co., Montreal—J. J. Coreoran.

Thomas Robertson Co., Montreal—S. R. Brewer and F. G. Mavor.

Standard Ideal Mfg. Co., Montreal—Arthur McDonald and Collins McDonald.

Montreal Rolling Mills, Montreal—G. D. Clewes.

Amherst Foundry Co., Amherst, N.S.—Wm. Knight.



JOSEPH LAURIER, MONTREAL,
Re-elected National Vice-President.

General Brass Works, Toronto—T. J. Carling.

Ideal Mfg. Co., Windsor—J. H. Ham. Standard Sanitary Mfg. Co., Montreal—Thos. J. Collins.

Lunkenheimer Co., Cincinnati—Jack Carling.

J. R. Martin, manufacturers' agent, Montreal.

The minutes of the last national convention being taken as read.

Trade Paper Complimented.

Secretary Knox dealt with a large mass of correspondence which had occurred during his time of office, and incidentally referred to the way that The Plumber and Steamfitter had identified itself with the Association, and to the objects and aims of the journal. He felt that this should be recognized and appreciated by the National Association. Later on Mr. Knox again referred to the help that the trade journals had been to the Association, especially dealing with letters from the editor of Plumber and Steamfitter, regarding the efforts to hold the convention in Toronto, and to the needless expenditure of printing a conference report after the trade from the Atlantic to the Pacific had already read the full report in The Plumber and Steamfitter.

Frank Cornish, Saskatoon, wrote asking for information regarding organizing the trade in Saskatchewan.

Daniel J. Shea, Fredericton, wrote asking for copies of plumbing by-laws, stating that an endeavor is being made to improve the standard of plumbing and secure a better feeling amongst the trade in New Brunswick.

The Caledonian Iron Works, Montreal, asked for a list of the members of the Association, similar to the "Red Book" issued by the National Association in the States.

Sub-Executive Report.

Mr. Knox then read the minutes of the Sub-Executive of the National Association of Master Plumbers, held in Montreal, which was as follows:

The first meeting of the National Sub-Executive was held June 16 in the

PLUMBERS EXPRESS APPRECIATION.

"Resolved that this Executive meeting of the National Association of Master Plumbers express its appreciation to the Plumber and Steamfitter of Canada for the numerous articles it has published aiming to extend the influence of our Association and to educate the trade to the folly of cut-throat competition in securing contracts, and we also call upon all friends of the Association to support our Canadian trade paper; the master-plumbers, by subscribing and by sending in matter for publication, and the manufacturers and supply men by advertising in the paper as anything done to strengthen it will help the publishers to make it a greater help to all branches of the trade."—Extract from the Resolution Committee's report adopted at the Montreal convention of the National Association of Master Plumbers, August 13-14, 1908.

Montreal Master Plumbers' Hall, 90 St. James Street. Those present were: John Watson, National President; Jos. Laurier, National First Vice-President; R. J. McCauley, Chairman of the Organization Committee, and J. E. Walsh, Provincial Vice-President for Quebec. J. E. Walsh being appointed Secretary. The reports of the meeting of the convention in 1907 were read by R. J. McCauley. After the reading of the minutes it was unanimously resolved that they should be revised before going to print. Various matters of importance

were then taken up and treated as follows:

1. Resolved, that the National Secretary write the different locals regarding the nomination of Provincial Vice-Presidents, asking them to nominate one of their members for the position of Vice-President of their respective Provinces. Their recommendation to be forwarded to the National Secretary to enable him to bring it before the National meeting. The different locals to be advised likewise to appoint their candidate as a delegate so that he might secure an insight as to the manner of conducting business.

2. Resolved, that the minutes of the last convention be put in proper form by the Sub-Executive at a meeting to be called on June 19. Twenty-five copies of said minutes to be printed after being approved.

3. Resolved, that the manner of voting and the powers of the delegates remain as at present.

4. Resolved, re the organization, that the chairman of that committee write the different Provincial Vice-Presidents for reports.

5. Resolved, that this meeting suggest that the regular convention be dropped for this year, and that a meeting be held in Montreal among the officers, Provincial Vice-Presidents and



HARRY MAHONEY, GUELPH,
Re-elected Treasurer for Another Year.

Chairman, and that every local be asked to send a delegate with the object of strengthening the National Association. The National Secretary to attend to all the details.

6. Resolved, that re capita tax, it be fixed at three dollars a member and that

the National Secretary be so notified. The meeting then adjourned at 12 p.m.

Four other meetings of the Sub-Executive Committee were held to revise the convention minutes of 1907.

On motion of Harry Munday, seconded by J. A. Gordon, the correspondence and the minutes of the sub-executive were presented and adopted.



GEORGE H. COOPER, TORONTO,
Vice-President for Ontario and Secretary of the New Toronto Association.

The following reports from the various officers were then read, and received with applause.

President's Report.

I have the honor of presenting to you my annual report as president for the year 1907-8 to our 13th annual convention.

The sub-executive decided in the early part of the year not to issue an annual report in book form, seeing that the trade papers had given such an accurate report of our meeting in their papers.

On April 22 the Sub-Executive held a meeting in Montreal when it was decided at this meeting to hold our next annual convention at Quebec during the time of the Tercentenary Celebration. On May 19 Jos. Thibeault and myself went down to Quebec but found we could not make proper arrangements for a convention meeting at this time. Your Sub-Executive held four other meetings to take up the correcting of the minutes of our last convention, and other work.

The correspondence that has come to hand has been very light, all of which

I have answered as received. I have written 27 letters in connection with association matter and have received 12.

I am the mover in a motion for several changes to be made in our Constitution and By-laws, and I hope the convention will take these proposed changes into consideration and adopt or amend as they consider best.

In looking over the history of our Association you will find, if it has done nothing else, it has made friendships that are everlasting between many of our members. I regret our National Association has not made the progress I was in hopes of at our last annual meeting, but we evidently have been on the decline for the past three years. I am, however, of the opinion that we are on the verge of better organization. The prospects in the West have taken a turn for the better and Toronto is about to organize on stronger bases, and the whole western country looks to Toronto to take the first step.

I might just here call your attention to the first meeting of the National Association, held in Montreal, July 1896. We had with us at this time three good friends from Boston, Messrs Tute, Davlin and Riley, members of the National Association of Plumbers of the United States. These gentlemen warned us at the time to go carefully along with our organization, that we were sure to have our trials and troubles and lots of hard work before we brought our association to perfection. It appears to me that our National Association never stood in more need of the wise and spirited exertions of its members than at present. I appeal to you to support the National Association and its work.

I would recommend that our membership take more interest in our trade papers than they have done in the past. I notice that the master plumbers of the United States give their journal a great deal of attention, but I must say you will see very few letters or even questions asked by our Canadian masters either in American or Canadian papers. Our trade journals have done a great deal for the good of our association and deserve our thanks. Our members should correspond frequently with the trade papers.

I extend to you my sincere thanks for the assistance I have received from the officers and members of the Association, trusting that you will forgive any short-comings of my administration. The future of this Association is in your hands. I ask you to give your best thoughts to the deliberations of this convention and your best efforts

to the formation of our common interests.

JOHN WATSON, President.
Montreal, August 12.

Vice-President's Report.

I must say that this year has been a hard one for the Association. You all know the reason, and I think in consequence that we should have more sympathy for our trade.

It is the interest of every trade to have an association, who will guide all business, protect the public from bad work, and help the architect to improve construction. I am sure that the public and the architects would find our Association interesting, when they see a group of business men meeting together to protect the public health, and to improve plumbing. We spend very much of our time and even our money to protect, first, the public health; second, the architect; third, our trade; and fourth, our apprentices, who have much difficulty in learning the business.

JOSEPH LAURIER, Vice-Pres.
Montreal, August 13.

Secretary's Report.

The past year has witnessed the severest test the Association has been



FRANK DEXTER, TRURO, N.S.,
The Vice-President who is Doing Things
in Nova Scotia.

put to since its beginning, owing to the apparent unconcern of the master plumbers generally. This unfortunate condition seems to be solely due to the fact that the constitution of the National Association of Master Plumbers is not competent to legalize the action of any individuals who by co-operative force might unfairly enhance prices and

impose restrictions on the welfare of the general trade.

If any master plumbers in any locality desire to have a legitimate arrangement whereby they may succeed in getting a combined uniform profit they can only lawfully do so by having the sanction of the Provincial and Dominion Government. This would involve inspection and audit by these authorities as a guarantee to the people that such an arrangement is worked strictly on legal lines. It is well that this truth should be ever present. Had it been always kept before us your proud and magnificent city, Montreal, might today, at this session, have been the busiest place on the telegraph line handing out congratulatory messages to the convention.

While the number in attendance is not as great as it ought to be, I venture to state that we still have the quality with us. The consideration of this association and its aims need public confidence and its support, and if the plumbing trade is worked up on these lines the plumber will benefit, the supply man will benefit, the manufacturer will benefit and all the people either directly or indirectly, will re-



H. A. KNOX, OTTAWA,

Elected Chairman of the Legislative Committee.

ceive a portion of the benefit. Bigger consumption means greater sales and greater sales mean greater profit. What more is wanted except the machinery to get it. That is supplied in the constitution of this Association, it simply teaches every plumber that if he desires to be useful to himself and the community he must get his municipality to lay down lines showing how the plumbing work should be done. When

this is arrived at he will be kept busy observing them.

There were several inquiries from the east and west for the by-laws governing Toronto and Ottawa. The president and secretary are always ready to give information of a like character. There was the meeting of the Sub-Executive held at Montreal on April 23, to determine where and when the convention should take place. It should be noted that notwithstanding the labors and expense Montreal had been put to at the last convention she generously offered to do the same this year. The Association is deeply indebted for this splendid act.

I have acted, under the circumstances attending my office as well as my ability and energy will permit. In making this known I would like you to transfer my responsibility to another more gifted than I to carry on more successfully the work that the secretaryship imposes.

H. A. KNOX, Secretary.

Ottawa, August 12.

QUEBEC REPORT.

The year 1907-1908 has been exceptionally quiet and uneventful in the Province of Quebec. In the whole Province only one city, Montreal, boasts a local. Outside of Montreal, efforts at organization appeared fruitless. Quebec, which at one time had its own local, has since lost interest in Association matters. I have kept in touch with the latter city more indirectly than directly, and from reports confirmed by a special delegation from the Sub-Executive, deemed it wise not to make any special efforts towards its reorganization.

In Montreal, the Association is simply holding its own, but with the reorganization of our sister Province of Ontario, prospects seem brighter towards a working schedule under the new by-laws sanctioned by the Lieutenant-Governor-in-Council. I should be pleased to have this convention take steps to devise means to interest the different locals in keeping together and working in harmony on a sound business basis for the united advantage of its members. The experience of the members as a whole should be worked for the benefit of the individual.

J. E. WALSH,

Vice-President for Quebec.

Montreal, Aug. 12.

ONTARIO REPORT.

As you gave me the honor at the 12th annual convention to elect me as Vice-President for Ontario, I beg leave to lay before you the following report for the year 1907-1908:

As you understand, Association work has been very difficult and very little

progress has been made, as there seemed to be a great lack of interest in Association work throughout Ontario, very few master plumbers taking interest enough or even the courtesy to answer communications in reference to the work. Of seventy-five letters sent out in the early part of the year, I received only one reply, and that unfavorable to



A. J. HAMMOND, WINNIPEG,

Re-elected Vice-President for Manitoba.

forming an association. The most encouraging part of the year's work is the fact that in Galt, Preston, Berlin and Waterloo there are local associations working together with Jas. Sectt, Galt, as President, the success of this association being largely due to his efforts and my suggesting the forming of the association among these towns.

No doubt it is only a matter of time when the Province will be again organized and the master plumbers of Ontario will be once more working together to the general advancement of trade interests, but we realize this will be slow work. I am sorry to say our local is not in a flourishing condition, it seems here there exists a trade jealousy and what is worse, a very eager desire to do business regardless of profits, these being, perhaps, the greatest stumbling blocks in Association work, the members not realizing that they should have a fair profit on all work turned out of their shops. This is more noticeably the case with the younger firms starting in business, and it is a problem that will have to be thought out and disposed of before we have a smoothly running association.

If you have any difficulty in filling the position for Vice-President for Ontario I would suggest the name of James Scott, Galt, as an energetic and pains-

taking worker and a very enthusiastic member.

Trusting that your 13th convention will mark a red letter day in Association work, as there has never in the past



A. C. J. WEEKS, VANCOUVER,
The Vice-President for British Columbia
and his Sister.

been a time when good work has been more urgently needed.

CHAS. TAYLOR,
Vice-President for Ontario.
Brantford, Aug. 10.

NOVA SCOTIA REPORT.

I beg to submit report of Association work in the Province of Nova Scotia for the year 1907-08.

It affords me pleasure to inform you that though our Association has not added to its numbers throughout the Province, we have a body of men who firmly believe that the Association must be maintained for the better protection of its members against imposition, injustice and encroachment upon its common rights and interests. I believe that our Association has reached a turning point in its career.

At a regular meeting of the Master Plumbers' Association at Halifax, on June 30, it was resolved that in the future the Association would be called by the name of "The Master Plumbers' Association of Nova Scotia," instead of "The Master Plumbers' Association of Halifax and Vicinity." A draft Act of incorporation was also drawn up, to be presented to the Legislature of Nova Scotia at their next session. I have mailed a booklet, together with a letter, to all the plumbers in Nova Scotia, inviting them to join, and I have already received replies from some who are willing to join. Therefore, with the work for another year properly started, I hope

that at the next convention of the National Association they will receive a report of progress re Association work in Nova Scotia.

Trade has been generally good, but a slight falling off on account of general depression in business throughout the Province.

F. DEXTER,
Vice-President for Nova Scotia.
Truro, N.S., Aug. 8.

SANITARY COMMITTEE'S REPORT

For this past year association work for me has been very quiet. I suppose that after a storm we must have a calm. I have no report to make. I have done no work. Kindly put a man in my office with some go in him.

Wishing you and the convention every success and hoping to see you



LEWIS LEGROW, TORONTO,
Who Submitted the Most Original
Report to the Convention.

meet in Toronto shortly, as we are again getting down to real organization.

LEWIS LEGROW,
Chairman Sanitary Committee.
Toronto, August 10.

Legislation Report.

Your chairman on Legislation begs to submit for your approval and careful consideration, first, that from the general information obtained, there is need for the public health and safety a uniform law governing the installing of plumbing in the Dominion, I, therefore, beg to suggest that the plumbing by-laws in Ottawa and Toronto be made the basis of an application by our National Association to the Dominion or the Provincial Government for laws to make the above universal. I would also like to see a law compelling artificial

ventilating in cities of 50,000 and greater.

I would further suggest that the apprentice problem be adjusted by legislation obtained on lines of having a certificate given by an examining board maintained by the governments where at periods they could be examined both in theory and practice.

Hoping you will give this your earnest consideration.

H. L. CHANDLER,
Chairman Legislation Committee.
Ottawa, August 11.

Apprenticeship Committee.

The Apprenticeship Committee report was presented in French by Joseph Thea-beault, chairman, the report being translated into English by J. E. Walsh. The committee advanced strong reasons why boys should be governed by well-defined rules and taught the trade thoroughly. The health of the people is of supreme importance and as doctors are powerless to cure disease unless good plumbing and sanitary conveniences exist a thorough training should be given every apprentice and trade classes should be established to assist the educational work. The committee reaffirmed the apprenticeship agreement adopted by the Ottawa convention in 1906.

Referred to Resolutions Committee.

It was moved by Harry Mahoney, seconded by J. Laurier, that the officers'



J. E. WALSH, MONTREAL,
One of the Hardest Workers in the
National Association.

reports be handed to the Resolution Committee.

The Credential Committee presented their report, giving the names of the

delegates to the convention as given above, and the report was carried.

President Watson then laid on the table, certain proposed amendments in the Constitution and By-laws, and these were held over for consideration until next day.

The convention adjourned at 5.15 p.m.

FRIDAY MORNING.

The convention assembled at 9 a.m.

The minutes of the previous day's session were read by Secretary Knox and carried.

Proposed Changes to Constitution.

The alterations to the Constitution and By-laws as proposed by President Watson were then considered.

To article 3 of the Constitution it was suggested that certain words be added which would create the National Association as the head body of the Local and Provincial Associations. At present, as the Constitution read, there was nothing that recognized the National Association as the head.

To article 4 it was proposed to make alterations defining the vote. There was nothing in the article saying how the vote should be taken.

The proposed amendments to article 12 required that Local and Provincial Associations should report their membership and officers to the National As-

Article 2. Changing the name "Provincial" at end of article to "National," the former being evidently an error in printing.

Article 4. To add two new articles, one defining the expenses of the Executive Committee, which was not mentioned in the present By-laws the other to define the Capitation Tax, how it should be drawn, and to state the time when it should be forwarded to the National Association.

Article 6. To take out the word "Dominion" and substitute "Provincial."

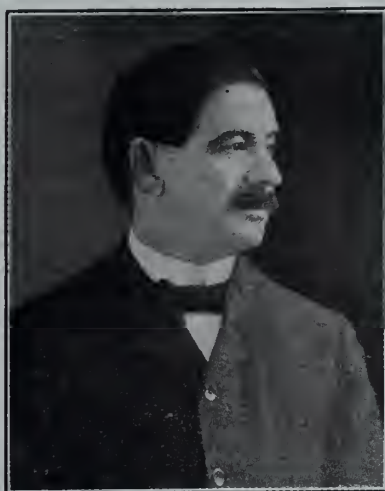
J. A. Thibeault proposed and Harry Munday seconded, that the proposed amendments to the Constitution and to the By-laws be handed to the incoming executive for their consideration, with instructions to report at the next

executive, as we are of the opinion that the trade papers' reports of the convention are all that can be desired.



CHAIRMEN OF COMMITTEES.

Harry Know, his Four-Year-Old Son; Peter Ogilvie and James Griffin.



JOSEPH THIBEAULT, MONTREAL,
Elected Vice-President for Quebec.

convention. This was carried unanimously.

The Nominating Committee.

H. W. Munday, Chairman; H. Mahoney and F. Dexter were appointed the Nominating Committee.

Report of the Resolution Committee.

J. E. Walsh, convener, then read the conclusions of the Resolution Committee on the officers' report, as follows:

We offer our heartiest congratulations to our worthy President for his very interesting report. In this report we wish the meeting to consider three clauses specially.

1. Regarding amendments to the constitution and by-laws we recommend as already decided that it be referred to the general meeting for discussion.

2. Regarding abolition of the annual report in book form, we concur absolutely with the finding of the Sub-Ex-

3. Regarding trade papers, we suggest the following motion:

"Resolved, that this Executive meeting of the National Association of Master Plumbers express its appreciation to The Plumber and Steamfitter of Canada for the numerous articles it has published aiming to extend the influence of our Association and to educate the trade to the folly of cut-throat competition in securing contracts, and we also call upon all friends of the Association to support our Canadian trade paper, the master plumbers by subscribing and by sending in matter for publication, and the manufacturers and supply men by advertising in the paper, as anything done to strengthen it will aid the publishers in making it a greater help to all branches of the trade."

We also congratulate The Plumbers' Trade Journal, of New York, for its able work in connection with our interests, and likewise fully appreciate its courtesy in sending for a second year such an able representative to our convention.

We commend the National Vice-President's report, as a whole, and draw attention to its two chief sentences which are worthy of our attention, namely, the improvement of general sanitation for the public health and the protection of the plumbers' interest.

We commend the two salient points of the Secretary's report. 1. The National



BEHIND THE BARS.

Frank Dexter and Harry Mahoney After an Interview with the Police.

sociation immediately after the election of officers.

The amendments proposed in the By-laws were as follows:

Association's constitution stands solely for everything that is legal. 2. That it is imperative that the master plumbers of every locality should impress upon their municipalities the necessity of improving their sanitary by-laws which would tend to the betterment of the plumbers' business. We heartily agree with him in his assertion that though the National Association is experiencing a great depression it still has the entire sympathy and approval of the quality of our master plumbers. We



PRESIDENT AND SECRETARY.

J. A. Gordon and H. W. Munday, the Chief Officers for Next Year.

congratulate the Secretary for his praiseworthy efforts.

We congratulate the Quebec Vice-President on his report, and recommend that his suggestions be carried out.

We take especial pleasure in noting the general tone of brightness of the Nova Scotia report. We recommend the work done towards the framing of a legal and workable constitution and by-laws, and shall be pleased if the meeting will have it read and given our consideration. We congratulate Chas. Taylor, Vice-President for Ontario, on his well written report. We regret the difficulties existing as regards competition, but experience much satisfaction at the knowledge of the general reorganization of the Province. We notice that there are no reports from New Brunswick and Manitoba, British Columbia and Saskatchewan.

We refer the report of the Chairman of Sanitation to the meeting, and felicitate him upon his frankness and honesty. We congratulate the Chairman of Legislature on his report, but wish to refer his report to the meeting.

The work of the Sub-Executive should be appreciated by the meeting by a vote of thanks and that its resolutions be concurred in.

The Apprenticeship Committee's suggestion regarding plumbing schools and contracts with apprentices should be carried out. We consider this report exceptionally meritorious.

J. E. WALSH, Chairman,
F. DEXTER,
L. J. CONROY.

In a general discussion that followed, Messrs. Mahoney, Knox and Munday paid tribute to the work done by the trade papers, and to the interest they took in the plumbing trade generally.

A discussion on plumbing by-laws brought about by the report from the Chairman of Legislation, H. J. Chandler, Ottawa, made it evident that general plumbing by-laws for the whole of Canada were impossible, although much was necessary to be done in the various districts. The delegates could not concur in the suggestion that the Toronto and Ottawa by-laws be used as models for Dominion legislation.

The Resolution Committee's report was, on the motion of P. C. Ogilvie and H. Munday, received and adopted, and handed to the incoming Executive for their consideration.

With the appointment of J. A. Gordon, P. C. Ogilvie and L. J. Conroy as the Auditing Committee, the morning session closed.

FRIDAY AFTERNOON.

The minutes of the morning session were read and confirmed.

Secretary Knox, in moving that the thanks of the convention be tendered to the Reception Committee—H. Munday, P. C. Ogilvie and J. Griffin—for the reception and entertainment accorded to the delegates, said that they, the delegates, could not express their appreciation enough of the Montreal Association in inviting them there again. Montreal would always be regarded as the saviour of the National Association.

H. Munday, as Chairman of the Reception Committee, expressed pleasure at such a kindly notice of their efforts, and was only sorry that the committee were not able to do more for their visitors.

Harry Mahoney moved that the sum of \$5 be handed as a gratuity to the caretaker of the Plumbers' Hall. This was carried.

The usual honorarium of \$100 was granted to the Secretary for his work and expenses of his office.

Secretary Knox said he felt complimented by the sentiment expressed, and believed that the Association would in time be able to pay a man \$1,000, so that he could devote full time to his duties, and would not be able to say that his business interfered with his Association work. He felt that in time

the Association would grow to be a great power in the Dominion.

It was agreed that the sum of \$25, which was allowed last year for the Provincial Vice-Presidents to organize their Provinces in order to increase their membership, be allowed this coming year for the same purpose.

TREASURER'S REPORT.

Treasurer Mahoney reported that the balance in hand was \$310.90 after all expenses had been paid. The auditors reported this correct after a supervision of the books.

The report on the motion of J. E. Walsh, seconded by L. J. Conroy, was adopted, and a hearty vote of thanks was tendered to the Treasurer for his loyal services to the Association.

NEXT YEAR'S CONVENTION.

It was moved by J. E. Walsh, seconded by J. Griffin, that the next place of meeting for the 14th annual convention be left in the hands of the incoming Executive; they to decide definitely at least within six months, or sooner, if possible, and notices of their decision to be furnished to the trade through the Plumber and Steamfitter. This was carried.



JOLLY SUPPLY MEN.

Joe Morris, (Dominion Radiator Co.); G. D. Clewes, (Montreal Rolling Mills); Tom Carlind, (General Brass Works), and Emil Dansereau, (Taylor-Forbes Co.) with Harry Munday sitting at their feet.

ELECTION OF OFFICERS.

The report of the Nominating Committee was then taken in detail.

J. A. Gordon and Joseph Laurier were nominated for President, and on a ballot Mr. Gordon was elected.

Joseph Laurier and J. E. Walsh were nominated for Vice-President. The

ballot was a tie, and the President gave his casting vote in favor of Laurier.

For the post of Secretary, both J. E. Walsh and Harry Munday were nominated by the committee, but the former withdrew his name. He was most anxious to help the Association, but on account of pressure of business he could not accept the office of Secretary.

H. Munday was then elected with acclamation.

Harry Mahoney was re-elected Treasurer.

George Cooper, Toronto, and James Scott, Galt, were both nominated as Provincial Vice-President for Ontario. Mr. Mahoney thought it would be well for the office to be held in Toronto, especially if the convention wished to help Association work in Ontario. Mr. Cooper was elected.

J. E. Walsh was nominated as Provincial Vice-President for Quebec. Mr. Walsh said that a French-speaking President would carry more weight in Quebec, and proposed the name of J. A. Thibeault, who was elected instead.

F. Dexter, Truro, was elected Provincial Vice-President for Nova Scotia; D. J. Shea, Fredericton, for New Brunswick; A. J. C. Weeks, Vancouver, for British Columbia; A. J. Hammond, Winnipeg for Manitoba, and E. J. Young, Calgary, for Alberta and Saskatchewan.

H. A. Knox, Ottawa, was elected Chairman of the Legislation Committee; J. Griffin, Montreal, Chairman of the Apprenticeship Committee; P. C. Ogilvie, Chairman of the Sanitary Committee, and H. J. Chandler, Ottawa, Chairman of the Essay Committee.

NEW OFFICERS INSTALLED.

Ex-President Watson then vacated the chair, and J. A. Gordon was conducted to his position with due honors. The President, with becoming modesty, said he did not think that the best man had been chosen, but he would do the best he could to fulfil successfully the onerous duties devolving upon him.

Harry Munday, in taking his Secretarial chair, said he appreciated the honor that had been conferred upon him. He was no seeker after office, but he was always prepared to sacrifice time to help on the Association. So far as the Secretaryship was concerned, he would do the best he could. His time would be devoted to the interests of the Master Plumbers' Association, and to the work he had before him.

Harry Mahoney, in response to a request for a speech, thanked the convention for their appreciation of his services, and said that so long as it was in his power he would be at every National convention.

THANKS TO RETIRING OFFICERS.

P. C. Ogilvie moved a hearty vote of thanks to the retiring officers for their services, and it was carried with acclamation.

John Watson was very pleased to see such capable men elected as officers. He was sure that they would do a lot of good work. The coming year would be a very trying time, but they had the right men in the right place.

The convention heartily endorsed this sentiment.

H. A. Knox, in a few well chosen words, referred to the pleasure he had taken in his duties, and wished that he could have devoted more time to them. He had identified himself with the advancement of the plumbing trade in Ottawa, and he would always be interested in the work of the Association and of the plumbing trade generally. He

interest of the plumbing trade of the Dominion, was carried unanimously.

With the singing of Auld Lang Syne and the National Anthem, the 13th annual convention was concluded.

ENTERTAINMENT FEATURES.

Owing to the little time to be devoted to entertainment, no extensive programme could be arranged by the Reception Committee, but a most enjoyable theatre night was held on Thursday at which the delegates and representatives of the various supply houses with the ladies attended. On Friday night a visit was paid to Dominion Park where the delegates had their fortunes told, shot the chutes, bumped the bumps and did all manner of things usually done by a jolly bunch of plumbers and supply men out for a good time.

PIPE DREAMS.

Harry Mahoney, Harry Munday and Harry Knox were there—but Harry Moulden was missed.

Sam Brewer says the girl at Bennett's theatre kept looking at Joe Morris when she sang: "I'm Living in Hopes of Getting a Man, a Real, Real Man."

Harry Munday said he wasn't going to play second fiddle any more and Harry Mahoney told him he ought to be glad he could get into the orchestra at all, the kind of a player he is.

Peter Ogilvie: "Twa moore Scotch's."

Tom Carlind had a fine line of samples of the General Brass Company's goods on view at Harry Munday's shop on Bleury St.

Some of J. H. Ham's stories were very porky.

Harry Knox in declining re-election as National Secretary said he was the father of six children and had a "growing" business. Guess he was right.

"Mumm's the word," said Wm. Knight, of the Amherst Foundry Co. and he said it so often that some of the boys realized that a "sham pain" could make a real pain.

Mr. and Mrs. Frank Dexter made a honeymoon trip to the convention. Frank says he isn't going to travel on the single-track line any more.

Harry Munday voiced the sentiments of all the delegates when he urged J. E. Walsh to accept the secretaryship. Mr. Walsh would have made a most capable officer who would not only have done the ordinary secretarial work but would also have made work to do.

If Harry Munday is anything he's a worker, so he ought to do credit to himself as secretary.

NEW NATIONAL OFFICERS.

President—J. A. Gordon, Montreal.

Vice-President—Joseph Laurier, Montreal.

Treasurer—Harry Mahoney, Guelph.

Secretary—H. W. Munday, Montreal.

Provincial Vice-Presidents.

Ontario—George Cooper, Toronto.
Quebec—Joseph Thibeault, Montreal.

Nova Scotia—F. Dexter, Truro.
New Brunswick—D. J. Shea, Fredericton.

Manitoba—A. J. Hammond, Winnipeg.

Alberta and Saskatchewan—E. J. Young, Calgary.

British Columbia—A. C. J. Weeks, Vancouver.

Chairman of Committees.

Sanitary—P. C. Ogilvie, Montreal.

Legislative—H. A. Knox, Ottawa.

Apprentice—James Griffin, Montreal.

Essay—H. L. Chandler, Ottawa.

would do his best to have a good delegation from Ottawa at the next convention.

F. Dexter, in referring to the progress of Association work in Nova Scotia, hoped that another time there would be more delegates from his district.

The motion that the appreciation of the Association be tendered to the representatives of The Plumber and Steamfitter of Canada, and the Plumbers' Trade Journal, for their able and devoted attention to the welfare and to the

J. J. Corcoran didn't act as a guide for visitors this year—probably because there weren't any strangers to need guiding. They'd all been there before.

Tom Carlind was on the job day and night. He earns his popularity.

Jean Paquette, who made a hit last year by his open-handed hospitality, was not in evidence this year. The Star Iron Company is now conducted as a separate concern.

No group photo was taken this year as the convention did not adjourn until after 5 o'clock.

Joseph Thibeault's report on the apprenticeship question won him much applause.

Sam Brewer received the congratulations for his brother, Charlie, who was married on Wednesday, August 13, to Miss Brand, of Port Hope. Customers of the Thomas Robertson Company can have one on Charlie next time he calls.

John M. Taylor didn't arrive until late but he made things move lively when he got on the job.

Harry Mahoney went on to Portland Maine, from the convention.

Who got put out of Dominion Park?

Alex Purdy was to have represented the Toronto Association but a severe attack of rheumatism kept him at home.

Frank Cornish, of Saskatoon, would have been a live vice-president for Saskatchewan. Another year Alberta and Saskatchewan might be separated.

The Montreal Association went down into its treasury for funds to entertain the delegates and supply men at Bennett's theatre and Dominion Park. No contributions were asked for from the supply men as they had amply shown their liberality at the convention a year ago.

J. E. Walsh was nominated for several positions but only allowed his name to go to one ballot and he lost the National Vice-presidency only by the deciding vote of the chair, the French securing the point over the Irish.

Lou Legrow's report has been hung on the wall by the Montreal Association in a gilt frame, above the inscription. "Here's An Honest Man."

George Cooper says he would have gone down to Montreal if he had thought Toronto would be unrepresented. He did not like to lose a contract he was looking for, however, by being away two or three days. He will do his best to make Ontario heard from during the coming year.

Peter Ogilvie told how recently a Chicago enamelware manufacturer acted a few months ago. A departmental store gave them an order for baths, etc., but before filling the order a letter was sent the Montreal Plumbers'

Association, asking for information. When they heard that the intended customer was a dry goods firm they returned the order and wrote the Association advising them of their action. The Association then sent copies of the correspondence to the supply houses. The deal was a square one all round.

John Watson, of John Watson & Co., Westmount, Montreal, the retiring president, served his apprenticeship in Montreal, after which he spent eight years in Toronto in the employ of W. J. McGuire and Keith & Fizzsimons. Upon his return to Montreal he went into business with D. M. McCrae, under the firm name of McCrae & Watson. The firm continued for eight years, and eleven years ago started in business for himself in Westmount, and has not changed his present address for seventeen years. Among the contracts which he has carried out are: Queen's Hotel, Montreal; Bank of Toronto, Montreal; Bishop's College, Lennoxville, and the Fairman Bank, Montreal. Mr. Watson has attended every National convention, either as a delegate from his local Association, or as an officer of the National. Mr. Watson is nearly 51 years of age, and is as active and enthusiastic as ever.

HARRY MUNDAY'S RING.

An actor up to the footlights strode,
His strides they were immense
And from his lips there flowed
A stream of eloquence.
What made him reel with pain,
And his eyes so blindly stare?
'Twas the blaze of Munday's diamond ring
In his dress circle chair.

TWO POPULAR SALESMEN.

"Joe" Morris, or "Bernie," as he is known to old-timers, was one of the "live wires" in entertaining the delegates to the Montreal convention, and he was on the job from the time the first delegate arrived until the last one departed. Mr. Morris is probably one of the best-known supply men in Canada, his connection with the James Robertson Co. at St. John and Toronto, and his position as Secretary of the Central Supply Association, having given him a wide circle of friends before he accepted the management of the Montreal branch of the Dominion Radiator Company. Here as in other positions he has won success, some large railway and public building contracts testifying to his abilities as a diplomat and salesman.

"Tom" Carlind is another salesman who lost sleep and cashed checks in his endeavors to see that no visitor to Montreal during the convention went away without having a jolly time. "Tom,"

since the last convention, has given up his position with the Star Iron Company, and has branched out in the agency business, his chief line being the



J. B. MORRIS, MONTREAL,
Who is Making a Record for Himself as
The Eastern Representative of the
Dominion Radiator Co., Toronto.

fine assortment of plumbers' brass goods being put on the market by the General Brass Works, Toronto, his territory for these goods being his old stamping ground in Eastern Ontario and Quebec, as well as the Maritime Provinces. During the convention he had a display of samples in National Secretary Harry Munday's shop, and



T. J. CARLIND, MONTREAL,
One of the Most Popular Salesmen on
the road, Now Representing the
General Brass Works, Toronto.

they were admired by all who saw them. All of Mr. Carlind's friends in the trade and in lacrosse circles, wish him success in his new position.

The Right to Trade Protection

An Address at the Boston Convention
Plumbers by Wm. A. Dec

of the National Association of Master
ker, Grand Rapids, Mich.

Trade protection policies are championed by the live man in the business who realizes the necessity of this protection and appreciates it when he gets it. And there is not another retail business more entitled to a liberal policy of trade protection than the retail plumbing business as at present conducted.

It is hard to explain the inconsistency of the public in complaining and condemning our position, because they cannot buy plumbing goods at wholesale when they submit to the same rule in almost every other line of business and many are enjoying and consider just and fair the same principles in their own respective line of business or trade.

The question of what condition entitles a person to buy at the wholesale price is one that few people seem to understand or take time to carefully weigh and consider. No person, firm or corporation should be privileged to buy at wholesale prices unless the merchandise is bought to be resold by the purchaser, either in the original state or after the process of manufacture, and not for their own consumption or personal use. The quantity bought, personal station in life, or relationship of the purchaser, has no legitimate bearing on the question, and should not entitle anyone to special privileges.

Supply Man Must Protect.

If the manufacturers and jobbers sell a stock of goods to the plumber and then sell goods direct to the consumer at wholesale or even at retail prices, to whom can the plumber sell the goods he has placed in stock for sale, as he has been robbed of his only possible customer, the consumer. How is the plumber going to meet the bills when due or turn his purchase of stock into a profitable investment?

The usual defence of the wholesaler is that the average citizen does not attempt to buy at wholesale and will go to the retail plumber and buy his goods. But is this true? And if true, is this fair to the so-called average citizen or the plumber?

The millionaire, public official and the rest of the class who do most of the criticizing of our trade protection policies and practices are the least entitled to special prices and privileges, because they are the people who are financially able and should be willing to pay the plumber an honest and fair margin on his goods.

It is impossible for any plumber to get a competence or earn even a meager living out of the small margin which he

gets for furnishing journeyman labor, and he must have additional profit from the sale of material or go out of business.

One of the main reasons that the plumbing business is criticized so much is due largely to the lack of tact and general business ability on the part of the men engaged in the business, and also to the fact that our work is so closely related and connected with the general building business.

Different From Other Contractors.

In practically every other branch of the building business the contractor's stock on hand consists of a notebook and a pencil, and the majority do not even maintain an office, and therefore have practically no operating or fixed expense.

They are able to operate a large number of men with the minimum amount of superintendence, owing to the concentration of their help, while the plumber's help is worked in small crews or singly, scattered over a vast area.

The carpenter and mason contractors can thus earn a good income from the profit on his labor with a small or even without any profit on the material, owing to the lack of operating expense, and no investment in carrying a stock of goods with the attendant expense which it necessitates.

If the carpenter was obliged to maintain a lumberyard in order to carry on his business he would be obliged to get a profit on his lumber or he would be bankrupt in a short time.

These are facts and conditions which the public do not understand or fully appreciate, and this is the reason they complain because they cannot buy plumbing goods direct, the same as they can buy lumber, brick, etc., and have us do the work the same as in the other branches of the building business.

Indifferent Plumbers to Blame.

If the plumbers were better business men and would take the time and trouble to educate the people in regard to these matters, our trouble would be materially lessened and life in the plumbing business would be easier, more pleasant and bring returns that would enable the conservative element in our business to retire with a reasonable competence in old age.

The legal question of trade protection is one that has been in the limelight for the last four years to such an extent that there is no longer much doubt as to our legal right to insist on and main-

tain our trade protection, which is so vitally necessary to our business existence.

No law can be constitutional that prevents the wholesaler or manufacturer from refusing to sell to the consumer and confining his sales to dealers or even to certain dealers.

His personal desires and business judgment alone dictate what is for his best business interest, and which trade he prefers and he cannot be legislated out of business or out of his constitutional rights of running his own business.

A law compelling a certain jobber to sell you goods whether he desires to or not would be as unjust and unconstitutional as a law to compel you to buy off the said jobber if you did not care to deal with him.

Can Organize Legally.

All statutes of law to be constitutional must be based on the common or fundamental law of fairness and justice and this cannot exist under a statute that, in order to give one man additional personal privilege or advantage, thereby directly robs the other or prevents him from enjoying that same personal privilege of individual business liberty.

The entire question of legality or illegality lies in the matter of individual action, which is absolutely legal or the combined action or conspiracy to injure which is illegal.

The question of reasonableness must soon be given proper place and prominence in business or commercial law, which it will get just as soon as the business people of this country realize their necessities, demand their rights, and take part in the framing of the statutes, which are to vitally affect their business interests, instead of leaving it entirely in the hands of politicians and lawyers who have had no business experience and therefore cannot possibly do justice to all concerned even though prompted by honest motives.

Unless we can maintain and improve our trade protection we must soon face and solve the problem by a general reconstruction of our business.

This can be done by having the people buy their plumbing goods direct, and in place of the profits we now derive from the sale of the merchandise, charge for time and superintendence as professional services.

The firm of Johnston & McClymont, Portage la Prairie, Man., plumbers and steamfitters, have by mutual consent dissolved partnership. Mr. Johnston will in future carry on the business at the old stand, having bought out Mr. McClymont's interests.

Trade Classes Essential to Progress

Address by W. B. Gray, Louisville, Kentucky, at the Boston Convention of the National Association of Master Plumbers.

The Trade Class subject embraces so wide a scope that a brief treatment will not do it justice, and the following will have served its purpose if it awakens the reader to earnest reflection along the line of thought suggested.

Though it was once so considered by many, plumbing to-day is neither in fact nor opinion a matter of luxury, but rather an important feature of deep salutary interest—one of the essentials conveniently serving in the best interests of our health and that of our neighbors, and with which sentiment has no grounds for association. Therefore, any point involving the present or future welfare of the business deserves serious attention. The education of apprentices is such a question, yet it is so remote from the immediate dollars and cents income that it apparently fails to make a sufficient impression to secure proper consideration at the hands of those who should be most interested.

Apprentice Must be Educated.

The plumber of the future will hail from the usual source, of course, and the light in which the public regards the plumber and the importance of his trade will have even more bearing on the character and earnestness of those who take up the calling in the future than in the past. The rank and file of apprentices have already too long been attracted by little else than the promise of a livelihood. There is ample room to begin a plumbing career with all the pride felt by followers of any other profession. It is altogether improbable that any applicant will be found with so much education or promising ability as to give rise to just grounds of fear that plumbing will not offer him sufficient scope to acquit himself with dignity.

In its advancement, plumbing is merely keeping pace with the lines on which it is dependent, the progress of which has created many new conditions to be met and overcome by the plumber. The general increase in height and extent of buildings, change in material and design of fixtures, increased demand resulting from decreased cost of goods and natural growth of population, together with the gradual awakening of the people to the value of sanitary conveniences, has brought about a state of affairs that the old line of plumbers would be incapable of coping with and which the old apprenticeship system is inadequate

of providing men capable to deal with in a creditable manner.

Large Contracts Require Study.

The plumbing of one large building now embraces as much work as hundreds of the average job of the part. The handling of extensive instalations under such conditions as existed, developed a deplorable state of so-called specialism. Men engaged in "roughing in" large jobs were often strangely ignorant of what type of closets or other fixtures were to be used; they knew almost nothing of the principles or merits of plumbing fixtures—did not need to. Some of them had never connected a fixture. You would find by in-



Students' Lead and Iron Pipe Work.

quiry that the "finishers" on such work were equally at sea as to "roughing in" and accordingly ignorant of the whys and wherefores that govern the success of a job as a unit. These men, calling themselves plumbers, were exceedingly skillful and rapid within their limitations, but it is easy to infer the fate of a job entrusted to such hands alone, and in practice it has been proven that being merely lacking in variety of experience is sufficient to jeopardize creditable results on general work of the ordinary class.

Opportunity to Learn Limited.

When the largest jobs are completed in a comparatively short time and much of the training which went to make up the plumber's accomplishments was credited to the manual practice necessary

to master the working of lead and solder, shop and job practice coupled with oral instructions from the journeymen served fairly well to make a plumber out of raw material within the period allotted by the American abridgment of the apprenticeship term. On the work of to-day, however, there are chances of an apprentice entering on and serving such a term, without seeing anything of more than a few jobs. He would be lucky if it fell to his lot to get even a little experience in each of the natural divisions of those jobs and again fortunate if those jobs happened not to have the same general lay-out and employ identically the same make of fixtures. Because, many shops seem to have the faculty of securing work from certain particular sources and are equally likely, for one reason or another, to be recommending and using, where possible, one particular make of goods to the exclusion of other kinds as good or better. These and kindred features are stumbling blocks, prohibitive in fact, to the learning of the plumbing trade within any prescribed time that can sensibly be given to acquiring it without aid from some source not formerly reckoned on.

Trade Classes Necessary.

For a score of years the often avowed reluctance of many journeymen to teach apprentices has been held responsible for the trend of apprenticeship affairs, but in the light of what has been said it is easy to determine what really introduced Plumbing Trade Classes and Plumbing Correspondence Schools. It was necessity. Necessity, in one sense caused "The Battle for the Boys" and led Col. Auchmuty to establish the New York Trade Schools—to do then, what the journeymen would not, and to which may now be added "cannot altogether if they would."

Trade journals have been and are doing good work in this line, but their best efforts added to the opportunities of practice are not now sufficient.

There are many legitimate classes in the country, striving for the best interests of the trade, often in the face of opposition from the journeymen or masters. There are also some persons exploiting the trade school merely for what money can be gotten out of it by rash promises, fraudulent claims and false teaching.

A Supplementary Education.

It takes years to master any trade worth following and no school with the pupils' interest at heart claims to graduate finished mechanics. It is misleading to claim that any school course will shorten the actual experience course required. The most that can truthfully be said is that the trade schools insure a better mechanic at the end of the apprenticeship term; for while a course at day, night or correspondence school has become second in importance only to that of experience in commercial work, the actual practice will ever be the prime factor. With masters exhibiting indifferent interest on the apprentice question and journeymen eager to limit them to a ratio that would soon annihilate the craft it is no wonder that the whole matter is in a state of confusion.

Under the present conditions it is not only apprentices and those who design becoming such, but journeymen as well, who need to seek aid in the schools. And, the citizen at large is serving his own interest by informing himself in a general way at the same fountain, so as to be able to discriminate for himself.

No Secrets to Hide.

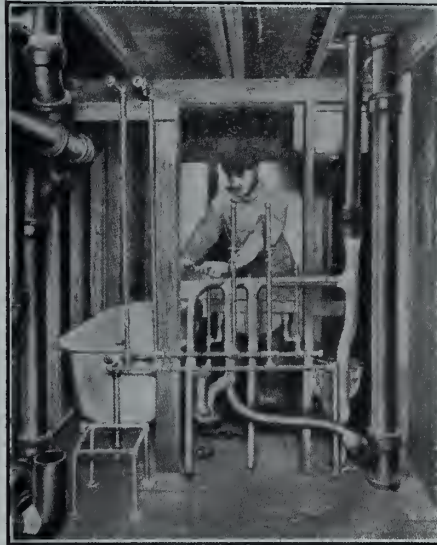
Any real plumber would prefer that his customer be familiar with the work in hand. Fewer misunderstandings occur in such cases and there is a keener appreciation of good work on one hand and a corresponding effort to merit approval on the other. There is, too, in favor of the plumber, when the customer is informed, an absence of those nigardly tactics of trying to secure much for little and of sacrificing quality and future satisfaction by reducing first cost below safe limits. The well informed customer never makes you feel that all plumbing is alike to him and a necessary evil to be paid for at rates far in excess of its value. This, perhaps, is the only consolation the plumbing fraternity will get out of the knowledge of the trade the public has gained by attendance at classes intended for the apprentice proper, but which were supported so indifferently by the trade that the promoters opened the doors to all in order to curtail the financial loss.

THE ST. LOUIS TRADE SCHOOL.

A place where practical plumbing is taught every month in the year by means of lectures and actual work done has been established by the St. Louis Trades School. The tuition fee is \$100, and the school is located so that suitable lodging and board can be had within a few minutes' walk of the school at \$3.50 to \$5 per week. Instruction is given to the pupils by a corps of instructors under the charge of M. J. Ward, who was a plumbing supervisor

for the building department of the Board of Education of St. Louis for a number of years and who has testimonial letters from a number of young men who served their apprenticeship under him during the past 30 years. He conducted a business as a master plumber previous to accepting important supervising positions in the city departments.

The pictures show something of the character of work which is done at the school. The instruction might be said to consist of three different parts, one of which is mechanical drawing as applied to drafting plans and elevations for the installation of plumbing systems, so that the young man may intelligently serve a future employer should he be given the blue prints furnished by the architect to begin the work of installing the plumbing in a building. The second part is actual practical work, not only dealing with the old lead work which is becoming obsolete in many large centres, but also with the



Roughing in Waste and Vent Pipes.

iron and brass pipe work which is being more widely adopted. The tuition fee permits the student to spend as much time at the school as he desires, so that he may become proficient in every branch of the work, from running soil pipe stacks to erecting both lead and iron water supply piping and setting the fixtures. After some proficiency in the handicraft is acquired, and the student has progressed far enough to understand drawings he is given a frame work of a portion of a building in the school and a blue print with instructions to get out the material and instal the piping for a bathroom, for a toilet room in a public building or any other piece of work the same as he would be expected to do if he were a journeyman in the employ of some master plumber. The third portion of the instruction is lectures on the principles involved, so that

if he diligently applies himself and makes the best use of his opportunities at the school he will know the weights per foot of the different kinds of material used, the best method of cutting and threading pipe, the fluxes which are needed for joining different materials, how to wipe joints on large pipes and seams in tanks; he will understand the effect of water hammer, the objection to notching floor beams for running pipes on account of weakening them, the principles of hot water circulation, the effect of freezing on pipes, the best method of testing plumbing systems, the use of grease interceptors, how to make repairs on different kinds of plumbing fixtures and fittings, and finally how to make up an estimate of the cost of a contract or a job and to keep a record of the time and material consumed so as to avoid any mistake in a computation of the cost when the work is completed. It is the endeavor of the school to provide for mechanics who have saved up some money the opportunity of becoming more thoroughly competent to do any kind of plumbing work, and being open at all seasons of the year the course can be taken when work is otherwise slack.

A catalogue issued by the school gives pictures of the students at work, and gives a clear idea of the drawings which the students learn to make under their instruction, their work as beginners in the shop, and finally the construction work which is completed by them before they leave the school.

AN ACTIVE WORKER.

F. Dexter, of F. Dexter & Company, Truro N.S., who was re-elected as vice-president for Nova Scotia, established his business in 1891, and under his management the company has earned a reputation for good work and square dealing, and have increased their business from year to year. Some of the leading contracts which they carried out in 1907 were: Bank of Nova Scotia, Truro, hot water heating and plumbing, \$4,000; I. C. R. Rest House, Truro, steam heating and plumbing, \$3,800; Poor Asylum, Truro, plumbing, \$1,600; Stanfield, Limited, Truro, steam heating, \$6,000. In 1908 they have completed among others the following contracts: Eastern Hat & Cap Company Truro, steam heating and plumbing; and the following residences: E. Baird, Truro, hot water heating and plumbing; Prof. Cummings, Truro, hot water heating and plumbing; D. G. McDonald, Truro, plumbing; Rev. Mr. Thompson, Truro, plumbing; W. D. McCallum, Truro, plumbing; also the I.C.R. car cleaners' building, Truro, plumbing; and the Truro Armories for the Dominion Government, hot water heating.

Displaying Goods Helps Business

Plumbers Can Develop Trade by Neat Shops and Window Displays—Exhibits at Fall Fairs—Co-operative Display Room Suggested.

TWO GODERICH DISPLAYS.

While there are some notable examples of effective window displays and neatly arranged shops with sample bath rooms, etc., Canadian plumbers do not as a rule, take advantage of their opportunities in this direction. In coming issues The Plumber and Steamfitter will illustrate some of these exceptions to the rule and the trade are invited to send photos of their windows and shop interiors for reproduction in these pages.

Charles C. Lee, Goderich, is one who knows the advantage of window advertising. The accompanying illustration shows his hardware and plumbing store decorated at the time of the fall fair a year ago. The picture has been taken too far away to show much detail, but it will readily be noticed that half of the window is arranged as a kitchen, with a sink, gas range, etc., and the other half as a bathroom, with a bath, closet, basin, range boiler and gas heater installed. This is an idea that can be worked out by any plumber. A few yards of oilcloth for the floor and wall and a few hours' labor is all that is necessary as the goods ought to be in stock for display purposes. Then the displays can be maintained with a little effort to keep the window clean and an occasional change, such as putting in a few sizes of radiators and a hot water boiler during the season when heating contracts are secured.

kind are helpful in educating farmers and others in what is available in the way of modern conveniences. A plumber



Plumbing Display at Goderich Fair.

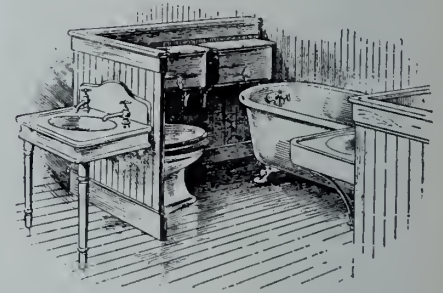
down in Maine has been making displays of model bathrooms at his local fair for three years and has secured numerous orders as a result. He installs a medium-priced bathroom, for instance, and puts up a card: "This outfit has

that what he can have they ought to have also.

Illuminate displays at night, keep them clean and they will help to bring business to you.

SAMPLE BATH ROOM.

In displaying plumbing fixtures to their best advantage it is generally conceded by manufacturers and practically all those who display fixtures that it can be done by showing them as they would appear in the finished bathroom. To accomplish this end elaborate rooms have been fitted up by some of the larger manufacturers and plumbers, but this is an expensive procedure frequently costing \$500 per room. In the accompanying illustration is shown an arrangement used by George Howard, plumber, Mount Vernon, N.Y. As will be seen by the illustration a division is made about the same size as a bath-



Sample Display Room.

room. It has the advantage of being easily constructed, and at the same time not requiring any artificial light or any blocking off of light from other sections of the store. Frequently such displays as this are connected under water pressure, which make them much more effective for displaying certain classes of goods.

SAMPLE ROOMS FOR BUILDERS.

One of the most serious obstacles which architects now have to contend with in the erection of new buildings and in connection with specifying plumbing goods is the lack of adequate display rooms of plumbing goods outside of the larger cities, writes D. Zeimer in the Metal Worker. In other lines there is excellent opportunity for the customer to see the goods desired, especially in the line of builders' hardware, as complete sample rooms are maintained in almost all cities, and even the coun-



Front of C. C. Lee's Hardware and Plumbing Store at Goderich.

Another of C. C. Lee's enterprising displays is shown, it being made at the Goderich fair last fall. Displays of this

been installed in Arthur Brown's new house," and as everybody knows Brown as an up-to-date young farmer, they feel

try hardware merchant carries a variety of stock, so that his customer may be permitted to select such goods as he desires.

At one time practically all plumbers except those who attended purely to jobbing trade made a considerable display of plumbing fixtures, but this at the present time is manifestly impossible with the great number of baths, both of enameled iron and solid porcelain on the market, as well as the variety of shapes made for different purposes. Not only is the space lacking for any display, but it is difficult to see where there would be sufficient profit to pay for making such an investment. In all probability the plumber himself cannot display the goods to advantage in his own shop, but a way may be found so that displays can be maintained, the advantage to accrue to the plumber himself and the expense borne by him rather than by the manufacturer.

The manufacturers have made extensive displays and fitted up their showrooms in an expensive manner in many cities, but unfortunately but a partial line can be seen in any one of these showrooms, as the manufacturer of enameled iron ware would manifestly not wish to display solid porcelain goods which he does not make, and vice versa, consequently for a customer to see the different lines of goods on the market he is obliged to go to the showrooms of two or three manufacturers or several jobbers who keep such a display. Many jobbing houses take particular pride in having attractive showrooms, but these are not always kept up to date, nor is the line complete, and very frequently customers come into these showrooms unaccompanied by master plumbers, consequently they can gain little or no information regarding the quality of the goods, and much time is wasted by several master plumbers in showing goods to prospective customers in the jobber's showrooms. Oftentimes the same customer is taken to showrooms by several different plumbers for the selection of goods for any one job, and this is quite frequently a small one.

A Co-operative Show Room.

The cost of this display whether made by the manufacturer, the jobber or the plumber, will ultimately be borne by the consumer, and consequently any display which will answer the consumers' needs and at the same time be economical to maintain will be of benefit to the trade. It is well within the range of possibility for the master plumbers' associations in any city or town to maintain at the expense of the association a complete showroom, showing the new goods and having them there either at the expense of the manufacturer or preferably bought and paid for by the local

association. This should be in some centrally located place and should be taken care of by some one who is not only thoroughly conversant with the merits of the various classes of goods, but who will command the respect of the architects. In this way the plumber does not have to go to the expense of carrying a large line of fixtures in his own shop and he is more independent regarding his buying. A scheme of this character, to my mind, would not only be a benefit to the consumers, but a benefit to the association, and would assist materially in riveting together the business interests of the members, providing them with an ever increasing source of profit. The expense of the institution, which would ultimately fall on the consumer, would necessarily be borne by ordinary assessments, and in this way would be an outlay of the members, but probably no more would be expected in fitting up a showroom of this character than would be by various members for showrooms of their own.



Strachan & Hebden's Shop at Nelson, B.C.

PROSPEROUS NELSON FIRM.

A fine window for display is shown in the illustration of Strachan & Hebden's building at Nelson, B.C., this firm having succeeded Hebden & Hebden, who opened business just ten years ago. At present the firm has on hand a \$60,000 contract for city schools, and another for a large Methodist church. They have just completed the heating plant of the C.P.R. station at Castlegar, B.C.

A SAMPLE ADVERTISEMENT.

As an introductory paragraph for a plumber's ad., the following is about as good as has appeared for some time:

Essential to comfort. No house of modern construction is now considered even half way com-

plete unless it has a perfect system of plumbing. The cost of this can be low if materials of ordinary finish are used. If more elaboration is desired the expense is greater, but in no case are our prices in excess of the value given. We do highly satisfactory work at moderate rates.

PROTECTS CLOSETS ON DISPLAY.

Currie & Livock, Ottawa, are using a novel idea to protect a row of about a dozen closets in their showroom. As will be seen by the accompanying illus-



Pipe Railing to Protect Closets.

tration, they have set up an iron pipe railing which completely sets off the closets from thoughtless persons who might damage the woodwork by sitting or placing their feet on the closets.

TRAVELERS AT NORTH BAY.

J. E. Farrell, one of North Bay's successful master plumbers, sends the Plumber and Steamfitter the accompanying picture, showing Geo. McQuillan, of the James Robertson Company, Toron-



GRIPS FULL OF ORDERS.

Two Well-known Traveling Salesmen Leaving the Pacific Hotel, North Bay.

to, and Jeff Hunter, of the Pease Foundry Co., Toronto, leaving the Pacific Hotel, North Bay, with their grips containing some nice booked orders.

Why Does the Price Cutter Cut ?

Domestic Engineering, Chicago, Tells of An Instance Where Tenders Showed a Range of Over One Hundred Per Cent. Plumbers and Fitters Largely to Blame Themselves for Careless Estimating—Educational Work for Associations to do.

Bids were recently received in an Indiana city for heating a residence by hot water. The architect provided general specifications and specified a number of well known standard makes of boilers that could be used and two makes of radiators. A complete plan of the house was furnished, with elevations showing amount of glass surface, points of compass, etc. The bids made for the job ranged from \$521 to \$1,299, a difference of over 100 per cent.

An outsider might suppose that this was an exceptional case, with some peculiarities that caused the low bidder to make a grievous error in figuring, that would result in heavy loss. This, however, was a plain, ordinary job of heating and one that it should have been easy to estimate correctly. Those familiar with trade conditions know that these wide differences in bids are altogether too common. The injurious effect on the trade, of this loose figuring, can hardly be over-estimated.

Accept Work at Actual Loss.

In the first place, the low bid in the instance quoted, quite likely represented an actual loss on the cost of labor and material, and business conducted at a loss is always harmful to trade as a whole, as well as to the individual. In the second place a wrong and demoralizing impression is created in the public mind. The general public is prone to believe that the low bid represents at least a margin of profit and the difference between it and the high figure the amount of unjust profit some contractors are willing to extort if given a chance, and there is usually some "joy" expressed that the "would-be robbers" got shown up. It must be admitted that there is some reason for this position, as the public assumes that no man thoroughly familiar with his trade will knowingly contract to do business at a loss. If this was a fact the condition would not be so serious, but the actual truth is that these low bids more often than not represent recklessly close margins of profit or actual loss on material and labor.

Careless Methods of Estimating.

Complaint is heard from time to time that the profits in the heating and plumbing business are not adequate for the capital invested. The instance quoted shows that the trouble is largely

with the plumbers and fitters themselves, for it is carelessness and haphazard methods of estimating and charging for work, coupled with, in many instances, an insane desire to get "business" regardless of proper profit, that is responsible for the unsatisfactory financial result attained by many plumbers and fitters, after handling perhaps large business and working hard for 30 or 40 years. It is a peculiar thing that in discussing this subject with the trade in a general way, it is hard to find anyone who admits doing business on a close margin. It is always the other fellow. Nevertheless, it is quite common to hear the statement that time cannot be taken to figure every job in detail. No, can't afford to spend time figuring, but can afford to lose anywhere from a few dollars to several hundred, perhaps, when the job is secured.

The Ignorance of Inexperience.

It is claimed by some that the young journeyman plumber, who gets into business for himself, is largely responsible for this trouble, as he often starts out with practically no shop experience and is content to add, say 5 per cent., to a job after figuring in his own labor. It is undoubtedly true that the business ignorance of these men is a serious contributing cause to the condition, but their ability to underbid is not so great as concluded by some, for the reason that they buy in small quantities and have to pay a higher price for their materials. Furthermore, that this is not the real or only cause of the trouble is proven by the fact that in the case quoted the firms bidding maintained regular shops and had been in business for some years.

In very big work there is, of course, room for a considerable difference in figures, and the low man may come out whole, even if he makes no money. Again, big contractors will sometimes knowingly take a fair sized job at approximately cost as a "leader" to get in on a very big contract. This kind of work is also taken at cost to hold and keep a large force of men busy in dull times. These, however, are exceptional cases and not without justification on sound business principles. It is the foolishly wide difference in bids on the average job that is being let every day that is radically wrong, that injures the reputation of the trade as a whole and

spells wasted effort and disappointment for those engaged in it. The intention to instal cheaper material than specified is suggested as an explanation of some low bids. This is admittedly a factor in some cases, but it cannot be taken as the chief cause, as even the substitution of inferior material would not vary the cost 100 per cent. The fact of the matter is, many plumbers and fitters have no correct knowledge of the cost of doing business and only a confused idea as to what is really a fair profit on the cost of a job, to provide for the exigencies of business and standing shop expenses. Even among those who realize the importance of these considerations there is a wide difference of opinion as to the proper margin to figure on and the steadfastness to which this basis should be adhered to.

Should Organize and Educate.

Capital invested in business is entitled to a profit commensurate with the hazards involved, and if it cannot be produced it had far better be withdrawn and put into a safe investment. The question of profits in the plumbing and heating business cannot be regulated by agreements or combinations, even if such were legal. It is a question for each individual to meet squarely and solve for himself. Some good might be accomplished, however, if those men in the trade who have arrived at definite conclusions on cost and gross profit necessary to properly carry the business, would discuss the subject freely and constantly with the members of the craft in their associations and through the trade publications.

Past experience has shown that waiting for the price cutters to fail and get out of business is slow and unsatisfactory. The disease in this business is not usually immediately fatal. It rather takes a slow, insidious, lingering form, immensely disagreeable and discouraging to all concerned and keeping the whole business in a continued state of anxiety and unrest.

A campaign of mutual education on the matter of cost and the wisdom of making adequate profits would be beneficial to all.

As it stands now the price cutter cuts because :

1. He has no time to figure. That is mental laziness.

2. He has omitted essential details. That is carelessness.

3. He does not know the cost of material or labor. That is ignorance.

4. He intends to substitute. That is despicable.

5. He intends to lose money. That is insanity.

Now, what is the remedy? The truth about business acquired through education.

AT THE WINNIPEG RACES.

Plumbers are good sports and enjoy a ball game or the races as much as any class of men could do. And that they take the full measure of enjoyment is well illustrated by the accompanying pictures. In one (from left to right) are Alex. Litster, of Green & Litster, Fred Litster, of the same firm, Sam Tait, of the J. H. Ashdown Co. and Joe Turner, of the Standard Plumb-

ECONOMY OF SPACE IN PLUMBING FIXTURES.

The design of many of the new types of plumbing fixtures has been made specially to promote economy of space in the building in which they are installed, writes C.T.R. in the Metal Worker. Frequently much space is wasted in rooms too small to accommodate even ordinary size fixtures. A recurring cause of this trouble is a large sink with double drain boards as well as laundry trays in a small kitchen. This difficulty might be easily eliminated by securing the combination laundry trays and kitchen sinks now on the market. The only difficulty with this is apparently the fact that the sink is higher than usual, but many plumbers will tell of setting kitchen sinks higher than ordinary in accordance with special requests to that effect.

A new laundry tray on the market makes a specialty of this economy of

use under stairways and other limited quarters and that the reason of their great popularity was through the effort of jobbers to push them, as a closet could go out in two packages instead of three and there were no long pipes to be carted.

RUSTING OF IRON.

It is a general idea that the rusting of iron is due to the action of moisture and other atmospheric agencies alone. These agencies do cause the iron to rust, but electrolysis, caused by contact of substances electronegative to iron, greatly increases the rapidity of this action. Lead and copper have this action, and, inasmuch as these metals are frequently used together, more regard should be paid to the manner of using them. The use of red lead for protecting iron from rust is based on a wrong understanding of its action. Red lead is more electronegative than either



Watching the Races at Winnipeg Exhibition.



Settling Up After the Races.

ing Co., Winnipeg, watching the races. The second view completes the "before and after" effect, showing Joe Turner, Alex Green and Sam Tait cashing up to Lawrie Anthes, of the Toronto Foundry Co., Toronto, he having been the winner of the stakes.

TORONTO PLUMBERS' PICNIC.

The Toronto Plumbers', Steam and Gas Fitters' Union held its annual picnic at Scarboro Beach on Saturday, August 16, at which a series of games, tug-of-war, and drawing competitions took place. Dancing in the evening wound up a pleasant day's outing. J. W. Bruce was chairman of the committee which looked after the arrangements; W. J. Storey was Treasurer, and A. Callis was Secretary.

space, there being but two cocks for the hot and cold water for both compartments of the tray, water being turned from one to the other by a tilting waterway, while the sink itself can be readily raised out of the way when it is desired to use the tray for laundry purposes. Then, too, the cover of one laundry tray, the sink occupying but one tray, is designed to be used as a drain board.

Another source of economy in the kitchen is the use of a horizontal range boiler in place of a vertical one, but if it is desired to use a large range boiler it can often be put in an adjacent closet where there is plenty of space.

Attention is frequently called to the use of low closet combinations where a high one would be much better, as the low combination takes up more floor space. It may not be generally known that these were originally intended for

metallic lead or copper, and iron in contact with it will rust more rapidly than when in contact with lead or copper.

EROSION OF STEAM FITTINGS.

Erosion of steam fittings by water in the steam was recently demonstrated by a test. Two $\frac{3}{4}$ -inch pipes were used, one known to carry water with the steam and the other dry steam. A flange union was put in each line, and between each pair of flanges a diaphragm of thin sheet iron was inserted, pierced by a $\frac{1}{8}$ -inch hole in the centre. Steam was then allowed to pass through both pipes for six hours a day for six weeks. At the end of the time the unions were taken apart and the diaphragms removed. The hole in the disk exposed to dry steam was unaltered, but that in the disk exposed to wet steam had been worn away so much that it resembled a keyhole.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

Minitonas, Man., is building a \$4,000 school.

Dartmouth, N.S., will erect a new school house.

M. Healy will erect a \$13,000 business block at Toronto.

A \$14,000 nurses' home is being erected at Victoria.

A \$20,000 hospital will be built at Alert Bay, B.C.

C. S. Gustafson, Vancouver, will build a \$7,600 warehouse.

Victoria's building permits for July amounted to \$106,080.

Plans are called for a new town hall at Glace Bay, N.S.

A \$20,000 armory will be built at Niagara Falls, Ont.

A new \$10,000 school will be erected at Port Stanley, Ont.

A new school will be built at Beebe
A new school will be erected this summer at Aylesbury, Sask.

The Bank of Montreal will erect a \$25,000 branch at Ottawa.

C. C. Farr, Haileybury, Ont., will erect a \$10,000 residence.

H. C. Ackroyd, Vancouver, will put up a \$10,000 business block.
Plain, near Sherbrooke Que.

A new Presbyterian Church will be erected at Brownsburg, Que.

The Bank of Montreal will erect a branch at Sawyerville, Que.

Mrs. A. Heaps will erect a \$13,000 business block at Vancouver.

R. J. Beazley, Halifax, will erect an \$8,000 residence at that place.

Montreal's building permits for July numbered 131, valued at \$391,620.

St. Michael's Palace, Toronto, is to be remodelled at a cost of \$25,000.

The Dominion Express Co. will spend \$35,000 on new stables at Ottawa.

G. C. Craig, Toronto, will build a \$10,000 business and dwelling block.

The Canadian Order of Foresters will erect a \$60,000 building in Toronto.

Toronto Catholic Foresters contemplate erecting a large central hall.

The Masonic Temple, to be erected in Toronto, is estimated to cost \$65,000.

Work will shortly be commenced on Hespeler's new Presbyterian Church.

Tenders have just been taken for an addition to the Yale Hotel, Edmonton.

The Bank of Montreal will erect a new building on Peel Street, that city.

Tenders are called for the new \$7,000 Ryerson Methodist Church, Hamilton.

St. Luke's congregation propose erecting a new church building at Annapolis.

The Independent Order of Foresters are erecting a brick block at Merlin, Ont.

Eglinton, Ont., Presbyterian congregation will spend \$5,000 on its new church.

P. S. Peacock has the contract for the addition to the Y.M.C.A. building at Welland.

The E. C. Tuckett estate will erect a row of dwellings in Toronto to cost \$16,000.

A \$100,000 church for Our Lady of Lourdes Catholic parish, Toronto, is talked of.

Contracts have been awarded for the erection of the new school building at Nelson, B.C.

F. Thorpe, Winnipeg, Man., will erect three houses on Alloway Street, at a cost of \$12,000.

J. M. McLuckie has the contract for the erection of the new normal school at Fairview, B.C.

Bloxhem & Saxon have the contract for West Toronto's new school. The price is \$19,250.

Oak Bay, (Victoria), B.C., school trustees have accepted plans for a new \$9,000 schoolhouse.

Tenders have just been taken for the erection of a brick school house at Kamsack, Sask.

A. W. Dixon will rebuild the International Hotel, recently destroyed by fire at Sackville, N.B.

J. E. Wize, Edmonton, has taken tenders for the construction of a brick school at that place.

An addition of two storeys is to be made to the Vancouver B.C., post office at a cost of \$30,000.

The Canadian Club, Camrose, Alta., will erect a two-storey structure, at an estimated cost of \$4,000.

The Dominion Government will build a post office at Dauphin, Man. The estimated cost is \$36,000.

Plans have been prepared for the erection of a new Carnegie library at Selkirk, Man., to cost \$20,000.

Contractor E. Cook will shortly begin operations on the construction of a \$60,000 business block at Vancouver.

The Washington Hotel Co., Seattle, are planning to erect a palatial hotel to cost \$750,000, at Vancouver.

The Buzzard House at Blenheim, Ont., has been badly damaged by fire. The structure will be rebuilt at once.

Vancouver's building permits for July were valued at \$635,120, a decrease, as compared with July a year ago.

The Junction House at Canfield Junction, Ont., has been totally destroyed by fire. It will likely be rebuilt.

E. G. Cope, Montreal, has been awarded the contract for the new club building of the Ottawa Hunt Club.

The Dominion Government has voted the sum of \$7,000 for the erection of a new post office at Cranbrook, B.C.

Tenders were recently received for the erection of the Faculty of Education and Pedagogy buildings at Toronto.

L. Larose has the contract for a business building to be erected at Quebec for W. McWilliam. It will cost \$15,000.

H. Marceaul, North Bay, Ont., has been awarded the contract for the new block to be erected for J. E. Gilmour.

Tenders are called for the building of three isolation cottages at the Royal Columbia Hospital, New Westminster.

West Toronto School Board has decided to erect a new two-room school building in the Scarlett Plains district.

The ratepayers of Fairview, B.C., have authorized the school trustees to borrow \$28,000 for school purposes.

H. G. Holman, Winnipeg, has just taken tenders for the erection of a four-storey solid brick and stone warehouse.

Burt & Andrich, Portage la Prairie, will erect a \$10,000 office and apartment block on Saskatchewan Ave. in the near future.

Plans have been accepted for the Brown and Mackenzie block, to be erected at Regina, at estimated cost of \$40,000.

Plans have been prepared for a \$50,000 business block to be erected by G. A. Graham and J. T. Horne, at Fort William.

Watt & Crane, Windsor, have awarded contracts for a building of three stores and six flats at cost of \$12,000.

Sim Duekchew, Vancouver, B.C., has been granted a permit for the erection of a brick store on Pender St. at a cost of \$12,000.

D. O'Connor, K.C., Ottawa, has been granted a permit for the erection of two brick stores and dwellings, at cost of \$12,000.

Alderman Eggerston, Winnipeg, has taken out a permit for the building of ten new houses at an estimated cost of \$36,000.

Newman Bros., St. Catharines, have the contract for the building of the \$20,000 Imperial Bank building at Welland.

The Halifax Hotel intends to erect a large addition early next season. An expenditure of probably \$50,000 will be made.

Wilson & Wilson, successful tenderers on Regina's collegiate institute, will begin work at once. Their figure was \$105,982.

A permit has been taken out for the \$300,000 domestic science building being erected by Mrs. Massey-Treble, at Toronto.

The St. John, N.B., Board of School Trustees will instal a hot water heating system in the manual training school.

A new three-storey wing will be erected in connection with the Maternity Hospital, Ottawa, at an estimated cost of \$9,000.

The Welland Public School Board has had plans prepared for a four-room brick school building, to be erected in the near future.

Ouellet & Levesque, Quebec, have completed plans for a chapel to be erected for the Roman Catholic congregation at St. Anselme.

Wm. O'Dell, Vancouver, has the contract for the erection of the consumptive sanitarium at Tranquille. The building will cost \$100,000.

Carter, Halls, Aldinger & Co., Winnipeg have the contract for the new \$59,000 Lork Selkirk School to be erected at Elmwood, a suburb of Winnipeg.

Tenders have been received for the erection of two new school buildings, including heating and electric lighting, in the northwest suburb of Halifax.

H. Bell-Irving, Vancouver, B.C., has been granted a permit for the erection of a frame dwelling house and store on Harwood Street, at a cost of \$10,000.

Bond & Smith, Toronto, have prepared plans for a \$14,000 two-storey and attic brick dwelling to be built on Grenville Street for Z. A. Lash.

The directors of Ridley College, St. Catharines, are contemplating the erection of a third building on the college grounds, across the old Welland Canal.

Architects Stewart & Witton have taken out a permit for a brick addition to the Picton street school, Hamilton, which will be built at a cost of \$25,000.

The contract for the construction of an addition to the Victoria post office has been awarded to Dinsdale & Malcolm, at \$15,000.

Tenders were received recently for the erection of an addition to the school building in Section No. 11 of the Township of Sidney, Frankford, Ont.

Waterworks and Sewerage.

Woodstock, N.B., is extending its sewerage system.

Lindsay is beginning work on its filtration plant.

Smith's Falls will extend its waterworks and sewerage systems.

Improvements to Hull's waterworks system are said to be necessary.

A number of waterworks standpipes will be erected in St. John, N.B.

Hamilton's city engineer wants \$30,000 to complete the new septic tank.

A satisfactory test was made of the engines at Medicine Hat's waterworks.

North Vancouver's water mains are to be wooden pipe, 19,000 feet long.

Montreal's finance committee recommends new water mains on about a dozen streets.

Dartmouth, N.S., will spend about \$59,700 on extensions to its water and sewage systems.

Medicine Hat ratepayers will on August 21 vote on a by-law to raise \$70,000 for sewers.

The new sewerage and waterworks schemes proposed for Cobalt are held up for lack of money.

New Westminster ratepayers have passed a by-law to raise \$32,500 for waterworks extensions.

Oak Bay (Victoria, B.C.) property-owners are petitioning for sewers on three streets in that town.

Woodstock, Ont., expects to have natural gas by winter, a strike of gas having been made at Innerkip.

The ratepayers of Ponoka, Man., will, on August 10, vote on a by-law to raise \$5,000 for drainage and sidewalks.

The City Gas and Electric Department is doing extensive construction work on its mains at Sherbrooke.

The ratepayers of Red Deer, Alta., will on August 25 vote on a by-law to issue \$30,000 for sewerage purposes.

The North Vancouver Council are considering a by-law to borrow \$30,000 for the Lynn Valley Waterworks district.

Carman, Man., ratepayers will on August 18 vote on a by-law to raise \$25,000 to repair its new waterworks system.

The Goat Mountain Waterworks Company has been formed to provide a waterworks system for Creston, a town in the Kootenay.

Carman, Man., ratepayers will soon be asked to vote on a by-law for \$25,000 for repairing and completing the sewer and waterworks systems.

A complete sewage system and sewage disposal works will be installed by the town of Vernon, B.C., at an estimated cost of \$57,500.

The contract for the construction of a trunk sewer on Jasper Avenue, Edmonton, has been awarded to Westaway & Manders, at contract price of \$21,351.

The Northern Pine Line Company has been incorporated with a capital of \$100,000. This is the line which is to supply Wallaceburg with natural gas.

G. T. Martin, of Smith's Falls, and J. Rabb, of Perth, have been awarded the contract for sewer excavation. The contract amounts approximately to \$20,000.

A by-law submitted to the ratepayers of Red Deer, Alta., to extend the waterworks system on Gaetz Avenue and on Victoria Avenue at a cost of \$4,500, was carried.

The ratepayers of Straasburg, Sask., will vote on a by-law to raise \$6,000 for

the purpose of providing the town with proper fire protection, and provide a

A largely-attended public meeting at London passed a resolution unanimous-

ly favoring immediate submission of the by-law authorizing the installation of a high-pressure water system at the forks of the river, to cost \$200,000.

The Ottawa City Council has approved of extensions to the water mains in Ottawa east, to the property of the Ottawa Lumber Company, and extensions also in Hintonburg.

Competition is likely in the near future for the Chatham Gas Company. The Maple City Oil & Gas Company have applied for a franchise to pipe the city streets on the same terms as the present company.

The Chatham water commissioners at their last meeting discussed the project of extending the water mains to every part of the city. The completion of the mains will, it is estimated, cost \$10,000. The matter will be brought before the city council.

Superintendent Madison, Vancouver, has reported to the Civic Water Committee that the water mains in certain parts of the city are beginning to show the effects of electrolysis, through the leaking of the current from the rails of the tramline. A similar condition of affairs had prevailed two years ago, but the British Columbia Electric Railway Company had bonded its rails to the mains at many points, which had abated the trouble. In the last two months, however, it has again appeared.

The Calgary City Council has accepted the tender of John Gunn & Son, Winnipeg, for work on a gravity waterworks system, one of the greatest improvements ever attempted in the city. The tender was \$156,195, which includes work on the pipe line and excavations complete from intake to reservoir, a distance of over 10½ miles. The lowest tender was that of F. F. Fry, of Moose Jaw, at \$153,360. The next highest was that of the Redwood Manufacturing Company, of San Francisco, at \$172,000. The cost estimated by Consulting Engineer Mitchell was \$204,000.

The British Canadian Wood Pulp Company, which has a process for the manufacture of wood pulp from any kind of wood refuse, is making a bid for the gas franchise of North Vancouver. It has a demonstrating plant in this city to show how gas is made as a by-product in the manufacture of pulp at very little expense. This company is erecting a pulp mill at Port Mellon, Howe Sound, a few miles from Vancouver, and the pulp will be first manufactured at North Vancouver, if plans materialize, and then taken to Port Mellon to be manufactured into paper.

NEWS OF THE TRADE IN CANADA

I. Walden, North Vancouver, has sold his hardware and plumbing business to J. B. Paine and E. MacMillan.

Strachan & Hebden, Nelson, B.C., have the plumbing contract for the new school being erected at that place.

T. Blackburn, Windsor, has the plumbing contract for a new \$12,000 block of stores and apartments at that place.

Brickman and Baker, Stratford, have secured the plumbing and heating contract for the new Lutheran Church there.

F. P. Barr, St. John, N.B., has been awarded the contract for putting in the new heating apparatus at the cathedral.

C. R. Bowers, Chatham, was in Dresden last week, where he had the contract for the plumbing of Dr. Jeff's new residence.

R. B. Brown, Osborne, Que., has the contract for heating and ventilating the Metropolitan Bank and the public school there.

Fred. H. Barr has obtained the contract for installing the new heating apparatus at Christ Church Cathedral, Fredericton.

The Hamilton Board of Education has awarded the contract for plumbing and heating at the Technical School to Rodger Gibson & Co., for \$11,191.

The contract for heating and ventilating Balaclava street school, St. Thomas, has been awarded to W. W. Cadman, who will install the Kelsey system.

W. J. Walsh, plumber, Hamilton, has been awarded the contract for the plumbing throughout the new armories recently erected for the local regiments.

R. J. Butchart & Bros., Owen Sound, have secured the contract for the installation of a Gurney steam heating system in the Separate School in that town.

Sparks from the solder pot of a plumber at work in the clock tower of Kingston's City Hall, set fire to the dome of the building and caused damage to the extent of \$10,000.

J. R. Tacey, Vancouver, has completed the installation of a heating plant in the new Victoria West School, Victoria. It is the fan system with automatic regulation.

Architect Webster has been instructed to prepare plans for the plumbing fixtures at the King Edward school, Saskatoon. When these are completed tenders for the work will be called for.

Perry & Thorn, electrical contractors, Moncton, have been dissolved, Mr. Thorne retiring. F. G. Perry has been taken into partnership, and the firm hereafter will be known as Perry Bros.

The Toronto Board of Education has awarded the contract for heating and ventilating the Lansdowne school, Toronto, to the Fred. Armstrong Co., 277 Queen street, at contract price of \$12,800.

The W. P. Millar Hardware and Heating Company, Calgary, has been awarded the contracts for the sheet metal work and plumbing in the Provincial Land Titles Building being erected at Calgary.

Fred Armstrong, Toronto, has the plumbing contract for the Leslie Street School at that place; and the Heating and Ventilating Co., Toronto, will install a heating and ventilating system in the same school.

The work of enlarging and rebuilding the separate school at Guelph will start immediately. The contract for plumbing was let to Stevenson and Malcolm, and for heating to the Guelph Stove Co.

Alfred Armstrong, Niagara-on-the-Lake, has been busy all week with the plumbing contract he recently secured at the Van Arsdale property. Mr. Armstrong and his assistants have been very busy all season and expect to be busy for some time to come.

Keith & Fitzsimmons, Toronto, have the contract for the plumbing in the addition to Perth Avenue School, at that place. The Rutley Warming and Ventilating Co. has the heating and ventilating contract. The former is worth \$815, and the latter \$1,890.

With an eye to taking advantage of the resultant gas fitting business, W. C. Crawford of Tilbury is opening a gas supply store in Wallaceburg. Chas. Long, who was foreman of the work in Tilbury, will supervise the work in Wallaceburg.

The Stark Electric Company, West Toronto, which has been recently reorganized, will in the future be known as the Interurban Electric Company. The new company is vigorously working to put the plant in better condition and extend its business.

Reports from Wallaceburg indicate that mechanics and builders are very busy in that town, owing to new buildings at the factories and many renovations. Jas. Watt & Son, plumbers, of Chatham, have had a large gang of men at work there steadily for some time.

The Crane Company, which bought out the plumbing and steamfitting department of Boyd, Burns & Co., have been registered as an extra-provincial company in the Province of British Columbia, with head office in Chicago. The attorney is J. E. McIlreavy, general manager, Vancouver.

Two hundred steamfitters in the car shops of the Canadian Pacific, at Mont-

real, joined the ranks of the striking machinists on August 8. These men, who do the pipefitting work on cars, did not obey the strike order when it was first promulgated, but have since been persuaded to do so.

Stevenson & Malcolm, who had the contract for the erection of the most of the electrical effects on Wyndham St., Guelph, during the Old Home Week, are receiving many congratulations for their very effective work. The effect was extremely pretty and the contract was a very extensive one.

The plumbing, heating and ventilating contract on the Alexandra School, Saskatoon, which was let by the School Board to Elford & Cornish, amounted to \$1,989. The contractors have supplied the board with specifications of the work which have been approved. The Gurney system of heating and ventilating will be installed in the building.

The Chatham Steam Heating Company has decided to discontinue all flat rates and will next season put all services on meter rates. This change is due to the fact that certain flat rate users have wasted the steam. There is a prospect of the city putting in its own heating system in civic buildings where the steam heat has hitherto been used.

Mr. Helmuth Clucas, secretary-treasurer of the W. L. Clucas Plumbing & Heating Company, St. Louis, Mo., has been spending his vacation in Muskoka and visiting his father, H. Clucas, manager of the Toronto branch of the Canada Paint Co. He reports trade as being on the increase with building rapidly recovering from the slump of last spring.

George Calbeck and James Ashton have leased premises in Dunnville and have opened up for business in plumbing, gasfitting, steamfitting, cave-troughing and roofing. Both are experienced and competent men. Mr. Calbeck having been in the same business for three years as a partner of W. J. Stearn. Mr. Ashton is a first-class plumber who has been with Wm. Tipper & Son, Brantford, for 18 years.

A deputation of Galt plumbers waited on Mayor Patterson and requested that the general public be notified that hereafter it will be necessary for those connecting with the sewer to secure a permit at the Town Hall. Heretofore the plumbers have been in the habit of securing the permits, but a recent recommendation by the Board of Works makes it necessary for the person making the connection to personally apply for the permit. The Mayor agreed with the plumbers and for the future it will be necessary for the public to get permits at the Town Hall, hand them to the plumber, who will fill his plans.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Aug. 17.—Taking plumbing supplies generally, conditions have certainly improved the last week or so. Orders have increased in numbers, while the quantity is certainly tending to heavier bulk. Considering conditions the various supply houses express themselves as satisfied with the trade doing and with the prospects of an improvement in the fall there is no lack of confidence as to the way things are shaping. There is a diversity of opinion as to whether a strong stimulation in building operations will take place in the fall. The realty market has been more active lately, and this is, of course an excellent sign, although it does not necessarily mean that building will be improved thereby. Still, with money easier, there is no reason why there should not be a very active movement in the fall.

Plumbers continue to be fairly busy. Work outside Montreal is good, while there is no lack of contracts offering in the city. The falling off in the building of large business premises has affected the number of heavy contracts but the smaller buildings have been of about average number, while there has been no scarcity of residential houses. Plumbers on the whole, therefore, have been actively employed, although without any great rush of work.

Prices generally are unchanged, and manufacturers and supply houses are in a good condition with their supplies.

IRON PIPE—Iron pipe is in steady demand, with an improvement in the bulk of the orders. Prospects look favorable for a strong stimulation in the fall. Users' stocks are undoubtedly on the light side and a good call would bring buyers into the market strongly. Prices are unchanged.

SOIL PIPE—The demand is somewhat better again. Orders are of fair bulk. If the fall building operations turn out as favorably as many anticipate, soil pipe will experience a strong rally. Manufacturers are in good shape with their supplies. There is no change in prices and we continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Lead pipe is in fairly good demand, and inquiries point to a better call next month. The rise in the price of pig lead will probably mean an advance in pipe before long. At present we quote pipe and waste at 30 and traps and bends at 50.

SOLDER—Orders continue about the same. Prices are unchanged 19c for half-and-half and 18c for wiping.

ENAMELWARE—Producers appear uniformly busy. Plenty of enamelware is wanted at once, and as stocks are light manufacturers are kept going. Prices are unchanged on the best class of goods.

BRASS GOODS—With the strengthening of copper, brass goods are firming up, and although an increase in price is not general some lines have advanced. The demand has improved.

RADIATORS AND BOILERS—Trade has greatly improved and good business is anticipated from now on. We continue to quote radiators at 52½ and boilers at 50 and 10 off. Steamfittings are 60 off, with a good demand.

METALS—All the metals have strengthened lately, noticeably tin and copper. The former advance appears to be due principally to market manipulation, but the latter, while somewhat speculative, is also based on a stimulation in the domestic demand. We quote: Ingot copper, \$14.50; ingot tin \$32.50; lead, 3.70; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20; Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 2½c.

TORONTO.

Toronto, Aug. 14.—While no great activity is noted in the trade enough business is being done to create a satisfactory feeling. There is, too, an encouraging sentiment regarding prospects for future business, although the full extent of the revival which was hoped for this fall may not materialize before the turn of the year. City business continues to be the feature, while the country trade is better than during the early summer months.

Brass goods are slow and dull, and galvanized elbows are hard to obtain just now, there being a very good demand for them. On enamelware the slight advance on some grades of baths of a few weeks ago has been reduced, and the prices ruling during the first half of the year are again in force. Prices on other goods are stationary.

IRON PIPE—Satisfactory demand exists for this line with supplies fair. For 1-in. galvanized, \$6.75 is asked and for 1-in. black \$5.11 is the price. Cast iron fittings are at 65, and malleable fittings at 35 to 37½ off.

SOIL PIPE—Light pipe 60 and fittings 70 and medium and extra heavy pipe and fittings 70 per cent., remain the ruling quotations. Demand and supplies good.

LEAD PIPE—Pipe and waste are at 30 and traps and bends are at 50 per cent. Calking lead runs from 4½ to 5c.

SOLDER—Wiping, 18c and half-and-half, 19c, are about the prices asked. Business fair.

BRASS GOODS—This line continues slow and the improvement, if any, is scarcely perceptible. Fuller work 70 and compression work 65 per cent., continue the ruling features.

ENAMELWARE—The list issued by the Standard Ideal Co. on August 1 now governs prices, which are the same as those prevailing during the early months of the year. The demand is pretty fair and supplies are good.

BOILERS AND RADIATORS—The recent ease off in this line was of short duration and the call for these heating lines is again active. Supplies are good and prices are unchanged.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in **THE BOOKSELLER AND STATIONER**, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, posters. The Hough Lithographing Co. Limited. Office, No. 3 Jarvis Street, Toronto. Telephone, Main 1576. Art, good workmanship business methods.

THE BUSY MAN'S MAGAZINE is the most popular periodical of its kind. Why? Because each issue contains a strong list of original articles of interest to every Canadian. It also reproduces the most timely, instructive and interesting articles appearing in the other magazines and periodicals of the month. The cream of the world's periodical press is too valuable to overlook. **BUSY MAN'S** is on sale at all news-stands. Better still, send \$2 for one year's subscription. Mail it to-day. **THE BUSY MAN'S MAGAZINE**, Toronto.

IT PAYS FOR ITSELF.—The money you are now losing because you haven't a National Cash Register, would pay for one in a short time. The National Cash Register Co., F. E. Mutton, Canadian Manager, 129 West King Street, Toronto, Ont.

ADDING TYPEWRITERS write, add or subtract in one operation. Elliott Fisher, Limited, 129 Bay Street, Toronto.

REPRESENTATIVE WANTED.

WANTED in every town and village, a representative to take charge of the circulation of our various publications:—Hardware and Metal, Canadian Grocer, Financial Post, Plumber and Steamfitter, Dry Goods Review, Printer and Publisher, Bookseller and Stationer, Canadian Machinery, and **Busy Man's Magazine**. Good financial standing and business connection a strong recommendation. Just the position for a retired business man for his spare time. The MacLean Publishing Company, Limited, Toronto.



threaten you. See the chain? It will of its own weight fall from its locking pockets when working overhead. It threatens you with grave dangers when working in elevated positions. Discarded by us years ago, it is now being advertised as permitting a shift from one to other side of pipe without removing chain. It will permit the shift but it brings dire dangers with it because it

is not safe in all positions. We are pioneers in, and all our lives have studied, chain pipe tools. The "Agrippa" Single Jaw is without mechanical or construction fault—the only absolutely safe tool of equal capacity for crooked fittings or pipe. There's no other. Guaranteed and on trial from your dealer.

DISCARDED FEATURES

"AGRIPPA"



J. H. WILLIAMS & CO.

Pioneers in Chain Pipe Tools

BROOKLYN, NEW YORK

OUR "WANT ADS." get clerks for employers and find employers for clerks.

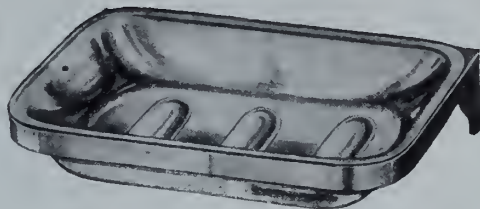
BOOKS FOR PLUMBERS AND STEAMFITTERS

Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

American Steam & Hot Water Heating Practice	\$3 00	Hot Water Heating, Steam & Gas Fitting, Acetylene Gas—How Generated and How Used. By J. J. Lawlor and Geo. T. Hanchett	2 00	Principles of Heating. By W. G. Snow	2 00
American Plumbing Practice	2 50	Kitchen Boiler Connections	1 00	Principles & Practice of Plumbing. By J. J. Cosgrove	3 00
American Sanitary Plumbing. By J. J. Lawlor	2 00	Lighting by Acetylene Gas, Electric Furnace Generators & Burners. By W. E. Gibbs, M.E.	1 50	Principles of Hot Water Supply. By J. W. Hart	3 00
Baldwin on Heating, or Hints to Steamfitters	2 50	Mechanical Drawing for Plumbers	1 50	Questions & Answers on the Practice & Theory of Sanitary Plumbing. By R. M. Starbuck ..	1 00
Contract & Estimate Record Book for Plumbers. By B. H. Jessup ..	1 50	Modern Plumbing, Illustrated. By R. M. Starbuck	4 00	Repair Kinks. By Martin L. Kaiser	50
Contract & Estimate Record Book for Plumbers (Pocket edition). By B. H. Jessup	50	Modern Sanitary Plumbing, Steam & Hot Water Heating. By J. J. Lawlor	5 00	Sanitary Engineering of Buildings. By W. P. Gerhard	5 00
Contract & Estimate Record Book for Steam & Hot Water Heating. By B. H. Jessup.....	1 50	Notes on Heating & Ventilation. By J. R. Allen	2 00	Sanitary House Drainage; Its Principles & Practices. By T. E. Colman	2 40
External Plumbing Work. By J. W. Hart	3 00	Outline of Ventilation & Warming. By W. J. Baldwin	1 00	Sanitary Plumbing & Drainage. By J. W. Hart	3 00
Fifty Plumbing Charts	25	Plumbers' Text Book, 300 Questions and Answers. By Frank Tower	1 00	Sanitation in the Modern Home. By J. K. Allen	2 00
Formulas & Tables for Heating. By J. H. Kinealy	1 00	Plumbing Catechism. By C. B. Ball and H. T. Sheriff	1 00	Sizes of Flow & Return Steam Mains	50
Furnace Heating. By W. G. Snow	1 50	Plumbing & House Drainage Problems	2 00	Steamfitters' Computation and Price Book. By Dean	3 00
Guide to Testing Plumbing. By J. K. Allen	25	Practical Gas Fitting	1 00	Steam & Gasfitters' Text Book..	5 00
Heating & Ventilating Buildings. By R. C. Carpenter	4 00	Practical Hints on Joint Wiping, for Beginners in Plumbing ...	25	Steam Heating for Buildings. By W. J. Baldwin	2 50
Hints to Plumbers on Joint Wiping, Pipe Bending & Lead Burning. By J. W. Hart	3 00	Practical Heating, Illustrated. By A. G. King	5 00	Steam Heating & Ventilation. By W. S. Monroe	2 00
House Drainage and Sanitary Plumbing	50			Steam & Hot Waterfitters' Text Book. By Thos. E. McNeill...	1 00
House Heating by Steam & Hot Water. By C. B. Thompson...	3 00				

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co. 10 Front St. E., Toronto



PRICES AND QUALITY
ARE OUR
STRONG POINTS.



CATALOGUE "F"
GIVES
FULL INFORMATION.

Canadian Wolverine Company, Limited

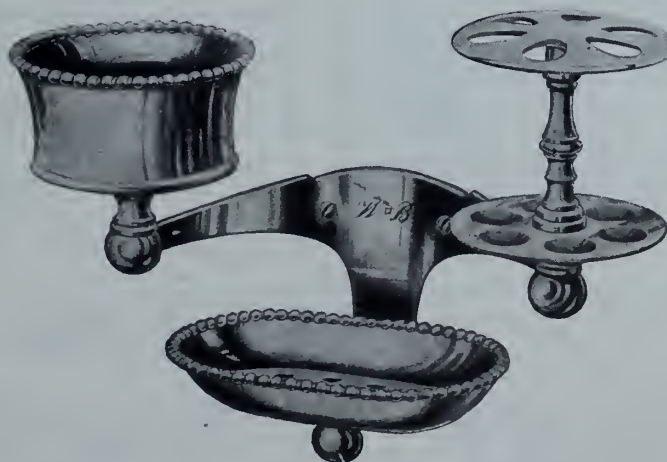
MANUFACTURERS OF

**BATHROOM
TRIMMINGS**

and PLUMBERS'
SPECIALTIES



Chatham - Ontario



A NEW INVENTION

Saves Money and May Save Lives

P. B. Bentley, of 70 Riverside St., Montreal has perfected a NEW HYDRANT which will be much sought by all the leading towns and cities of the Dominion. Send for description of this wonderful invention. **FULL DESCRIPTION OF IT GIVEN BY THIS PAPER.**

PATENT RIGHTS FOR CANADA FOR SALE. Write Me for Further Particulars.

THIS HYDRANT IS ABSOLUTELY NEW, and already the manufacturer is in negotiations with large cities like Montreal for complete equipment.

P. B. BENTLEY, 70 Riverside St., Montreal, Sole Owner and Patentee

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

Works at Valleyfield

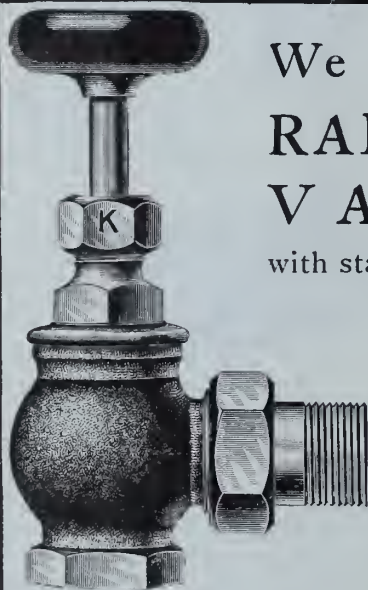
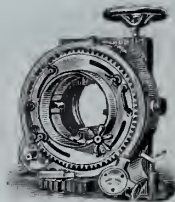
If your nearest dealer does not handle our goods, write us.

FOR BENCH OR TRENCH FOR HAND OR POWER

Pipe Cutting and Threading Machines. **FORBES PATENT DIE STOCK** saves carting your pipe to the machine. Regular sizes always in stock—prompt delivery. Write for Catalog.

THE CURTIS & CURTIS CO., - 38 GARDEN STREET, BRIDGEPORT, CONN.

No. 58 Hand Machine.
Range 2 1/4 in. - 6 in. R.H.



Sizes 3/4" to 2".

We make these RADIATOR VALVES

with standard brass disc, and with the Jenkins Disc, with and without Unions.

They are made from good metal, tastefully machined, and are handsomely plated and polished. Mounted

with best quality Wood Wheels. The Valves are right and the prices are right. All the large dealers sell KERR Valves. Ask for them. Our name is on every valve, and it guarantees the quality.

**THE KERR ENGINE CO., LIMITED
WALKERVILLE, ONTARIO**



THIS IS THE DAY OF

INVESTIGATION

Get in line and let us prove to you that the

GENUINE

Armstrong Stocks and Dies

ARE THE BEST.

Catalogue on request.



The Armstrong Mfg. Co.

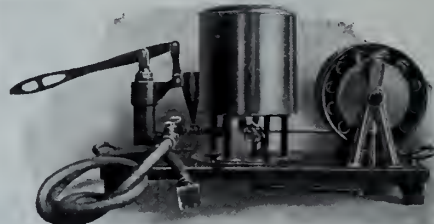
317 Knowlton St.

Bridgeport, - Conn.

When Addressing Advertisers Kindly Mention This Paper.

PLUMBERS YOU WANT THIS!

if you have frozen pipes underground
ANYONE CAN USE IT. WILL PAY FOR ITSELF IN



A SHORT TIME.

ASK FOR BOOKLET

MACHINES ON TRIAL

WHY NOT WRITE US

**THE BURBANK THAWING MACHINE CO.
BERLIN, NEW HAMPSHIRE, U.S.A.**

Toronto Hardware Mfg. Co.

TORONTO

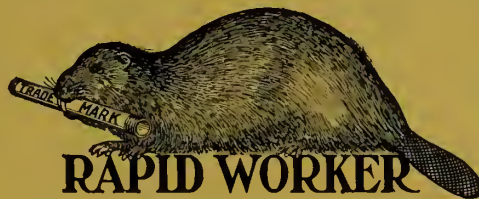
Manufacturers of

**Soil Pipe & Fittings
Range Boilers, Etc.**

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto

Do You Sell Radiators?

Perhaps you haven't pushed this line as hard as you might have done; but it's never too late to begin. There's more profit in selling a hot water heating system than in selling a hot air furnace. If you are selling

**"Sovereign"
Boilers and Radiators,**

there's a great deal more satisfaction in it for your customer, too. Sovereign Boilers and Radiators have exclusive points in their construction which makes them superior heating apparatus to all others. We'd like every dealer in Canada to know all about the Sovereign System. Send for particulars to-day!



TAYLOR-FORBES CO., Limited

TORONTO—1088 King Street West
ST JOHN, N.B.—H. G. Rogers, 53½ Dock St.

MONTREAL—122 Craig Street West
QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited
VANCOUVER, B.C.—Taylor-Forbes Company, Limited
CALGARY—The Barnes Company, Limited

THE STANDARD Ideal CO.

LIMITED

¶ This is one of the many new designs in Lavatories, that we have now ready for the market.

¶ We are also making a number of Baths, Laundry Trays and Roll Rim Sinks, which are entirely new.

¶ Particulars of these can be obtained on application to our Head or Branch Offices.

Head Office and Factories, Port Hope, Ontario

Branch Offices and Sample Rooms:

Toronto, 50 Colborne Street; Montreal, 128 West Craig St.; Winnipeg, 154 Lombard St.

The Labatt Manufacturing Co., Limited

MANUFACTURERS AND JOBBERS OF

Plumbers', Steamfitters' and Engineers' Supplies

High - Grade Plumbing Specialties,
Tools, etc.

367 Queen Street West
TORONTO

and

Bathurst Street
LONDON

PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St.

TORONTO, 10 Front St. E.

WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 17. (New Series).

Publication Office : 10 Front St. East, TORONTO, SEPT. 1, 1908.

Old Series, Vol. XX. No. 17

1908

DAISY

CIRCULATION

PERFECT CIRCULATION is as important in a Hot Water Boiler as in a human being.

POOR CIRCULATION is as common in Hot Water Boilers as in members of the human family.

GOOD CIRCULATION is absolutely necessary in the human to radiate good health, and in a Hot Water Boiler to radiate good heat, and lots of it.

THE DAISY.—Water circulation, is its strong point, balanced to a nicety—absolutely perfect—unapproachable.

RESULTS.—MAXIMUM HEAT, COMFORT AND EFFICIENCY
MINIMUM COAL CONSUMPTION, WORRY AND EXPENSE.

PROOF.—Over 30,000 satisfied users attest this fact.

WARDEN KING, Limited, Montreal

CLUFF BROS., Selling Agents, Toronto, Ont.

IN SELECTING A Steam Boiler

look your illustrated Printed Matter over to see

First : Is the water-line in the top push nipple, or four or five inches below it, as in the Gurney 900 Series Boiler.

Second : Are the firepot walls sloping and irregular, or straight and self-cleaning, as in the Gurney 900 Series Boiler.

Third : Is there only a thin sheet of water in the walls of the firebox or a generous bulk insuring a steady water-line as in the Gurney 900 Series Boiler.

Fourth : Do the sections butt close together, or are fitting-strips provided to prevent rust cracks, as in the Gurney 900 Series Boiler.

Fifth : Is it a foreign construction, or Canadian-made, like the Gurney 900 Series Boiler.

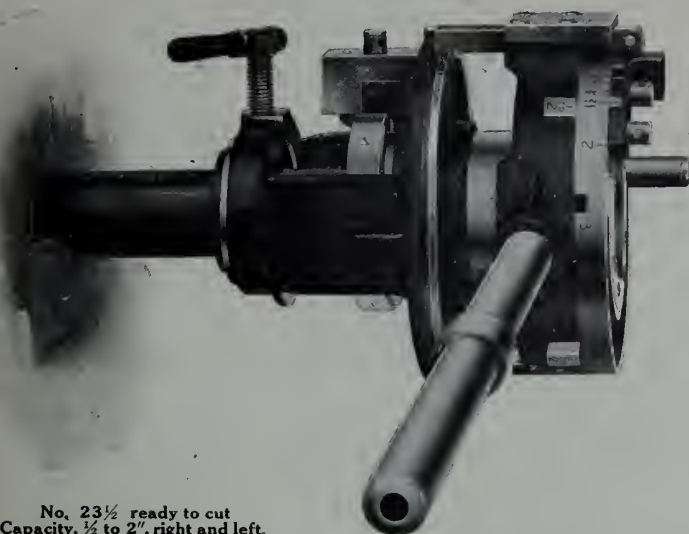


Note this extra water-arm directly over fire.



The Gurney Foundry Co., Ltd.

Toronto, Hamilton, London, Montreal, Winnipeg, Calgary, Edmonton, Vancouver.



No. 23½ ready to cut
Capacity, ½ to 2", right and left.

The Narrow EASY CUTTING DIES

for
Threading Pipe

Without a Leader Screw

This is just one of the points in regard to the new

"BUCKEYE" DIE STOCKS

MADE BY

The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

CHEAP

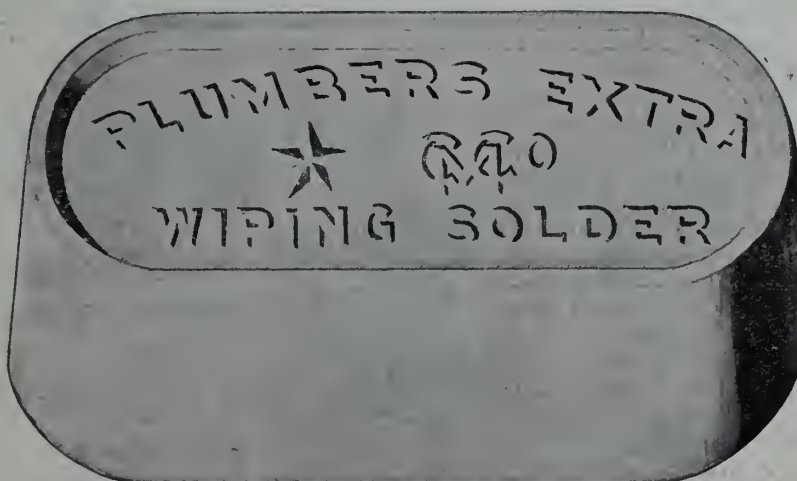
Solders come and go,
but the old reliable

Star Extra
Wiping

We ask a
fair price for
quality and it's
worth it.



IT'S THE SOLDER
WITH THE TIN.



Makes
friends as the
years go by.



Ask for it.

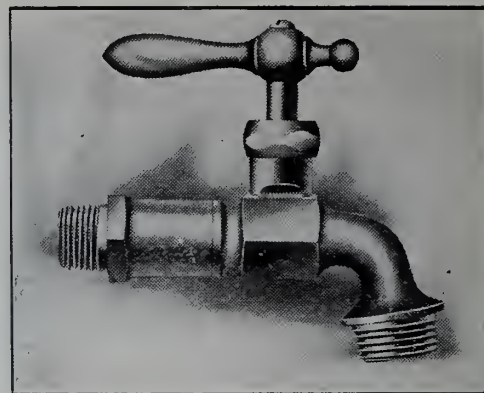


5 LBS. EACH

The Canada Metal Co., Limited, Toronto, Ont.



While we are not makers of ornamental brass, we aim to combine design and durability in making our



"Monarch" Cocks and Valves

There you have it—**Design, Durability, Moderate Price.** Result—Perfection, Satisfaction. These are all obtained by using "**Monarch**" brand. Use our Catalogue and a postage stamp, we will do the rest.

Monarch Brass Manufacturing Co., Ltd.

Office and Warehouse
278 Dundas St., Toronto

Factory
Port Colborne, Ont.

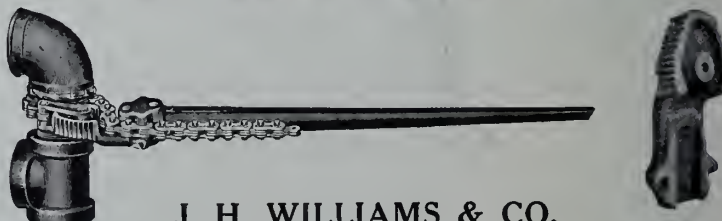


threaten you. See the chain? It will of its own weight fall from its locking pockets when working overhead. It threatens you with grave dangers when working in elevated positions. Discarded by us years ago, it is now being advertised as permitting a shift from one to other side of pipe without removing chain. It will permit the shift but it brings dire dangers with it because it

is not safe in all positions. We are pioneers in, and all our lives have studied, chain pipe tools. The "Agrippa" Single Jaw is without mechanical or construction fault—the only absolutely safe tool of equal capacity for crooked fittings or pipe. There's no other. Guaranteed and on trial from your dealer.

DISCARDED FEATURES

"AGRIPPA"



J. H. WILLIAMS & CO.
Pioneers in Chain Pipe Tools
BROOKLYN, NEW YORK

OUR "WANT ADS." get clerks for employers and find employers for clerks.

The Honeywell System of Hot-Water Heating

9,000 Systems in Use in America.

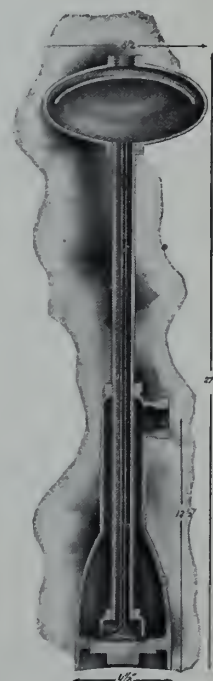
We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

While our Canadian representatives will give their attention to making the trade on this side acquainted with the merits of the Honeywell System of Hot Water Heating and render engineering advice to the interest of the fitters, we will not fill orders direct for our specialties, but will supply the trade entirely through the established Canadian dealers.

The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.

HONEYWELL
HEAT GENERATOR



The Honeywell Heating Specialty Co.,

Plant and General Office, Wabash, Indiana

M. D. Tillman, Box 1113, Montreal, Canadian Representative.

BOOKS FOR PLUMBERS AND STEAMFITTERS

Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

American Steam & Hot Water Heating Practice	\$3 00	Hot Water Heating, Steam & Gas Fitting, Acetylene Gas—How Generated and How Used. By J. J. Lawlor and Geo. T. Hanchett	2 00	Principles of Heating. By W. G. Snow	2 00
American Plumbing Practice	2 50	Kitchen Boiler Connections	1 00	Principles & Practice of Plumbing. By J. J. Cosgrove	3 00
American Sanitary Plumbing. By J. J. Lawlor	2 00	Lighting by Acetylene Gas, Electric Furnace Generators & Burners. By W. E. Gibbs, M.E.	1 50	Principles of Hot Water Supply. By J. W. Hart	3 00
Baldwin on Heating, or Hints to Steamfitters	2 50	Mechanical Drawing for Plumbers	1 50	Questions & Answers on the Practice & Theory of Sanitary Plumbing. By R. M. Starbuck	1 00
Contract & Estimate Record Book for Plumbers. By B. H. Jessup	1 50	Modern Plumbing, Illustrated. By R. M. Starbuck	4 00	Repair Kinks. By Martin L. Kaiser	50
Contract & Estimate Record Book for Plumbers (Pocket edition). By B. H. Jessup	50	Modern Sanitary Plumbing, Steam & Hot Water Heating. By J. J. Lawlor	5 00	Sanitary Engineering of Buildings. By W. P. Gerhard	5 00
Contract & Estimate Record Book for Steam & Hot Water Heating. By B. H. Jessup	1 50	Notes on Heating & Ventilation. By J. R. Allen	2 00	Sanitary House Drainage; Its Principles & Practices. By T. E. Colman	2 40
External Plumbing Work. By J. W. Hart	3 00	Outline of Ventilation & Warming. By W. J. Baldwin	1 00	Sanitary Plumbing & Drainage. By J. W. Hart	3 00
Fifty Plumbing Charts	25	Plumbers' Text Book, 300 Questions and Answers. By Frank Tower	1 00	Sanitation in the Modern Home. By J. K. Allen	2 00
Formulas & Tables for Heating. By J. H. Kinealy	1 00	Plumbing Catechism. By C. B. Ball and H. T. Sheriff	1 00	Sizes of Flow & Return Steam Mains	50
Furnace Heating. By W. G. Snow	1 50	Plumbing & House Drainage Problems	2 00	Steamfitters' Computation and Price Book. By Dean	3 00
Guide to Testing Plumbing. By J. K. Allen	25	Practical Gas Fitting	1 00	Steam & Gasfitters' Text Book..	5 00
Heating & Ventilating Buildings. By R. C. Carpenter	4 00	Practical Hints on Joint Wiping for Beginners in Plumbing ...	25	Steam Heating for Buildings. By W. J. Baldwin	2 50
Hints to Plumbers on Joint Wiping, Pipe Bending & Lead Burning. By J. W. Hart	3 00	Practical Heating, Illustrated. By A. G. King	5 00	Steam Heating & Ventilation. By W. S. Monroe	2 00
House Drainage and Sanitary Plumbing	50			Steam & Hot Waterfitters' Text Book. By Thos. E. McNeill...	1 00
House Heating by Steam & Hot Water. By C. B. Thompson...	3 00				

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co. 10 Front St. E., Toronto

A Substantial Mental Menu

AS the vacation season is now nearing its close, the Busy Man's for September contains a little more substantial menu than it has during the sultry days of July and August. Topics of the greatest interest are provided in this issue which contains the largest amount of illustrated matter yet presented. In a word, Busy Man's for September is what you are looking for. It will not prove a disappointment to any member of your household.

BUSINESS AND INDUSTRY

What Good Roads Mean to the Business Man
What the Postal Service Means to Business
Where Quality Counts More Than Quantity

ARTICLES FOR THE WORKERS

New Thought Creates New Life
Study the Art of Compliment

ENTERTAINING SHORT STORIES

Just An Error of Judgment
Stover, The Strategist
The Discovery of Mrs. Dugan
How She Answered the Call of Home
The Thirteenth Move

TRAVEL AND DESCRIPTION

Beautifying the Capital City of Canada
How Mr. Taft Spends His Holidays in Canada
Vivid Impressions of the Great West
A Moose Hunting Jaunt in New Ontario

THE September Busy Man's Magazine

is on sale at all newsstands

The Magazine with the Red Cover

20 cents a copy ; \$2.00 a year

LIFE STORIES OF SUCCESSFUL PEOPLE

The Oldest Working Journalist in the Dominion
A Man Who Stands by His Convictions
A Character Sketch of the New Bryan
A Thorough Believer in Democracy
How George H. Ham Dispenses Sunshine

POLITICAL AND COMMERCIAL AFFAIRS

The Young Man as a Factor in National Life
The Existence of National Sensitiveness

OTHER BRIGHT ARTICLES

Foreign Parasites and Their Prey
The Supremacy of Christian Ethics
What Cities Are Doing For Their Children
The Failure of the Professional Woman
How Insect Enemies Destroy Books
Has Twice Welcomed Royalty to Ancient Capital

ADDITIONAL FEATURES

Contents of the September Magazines
The Busy Man's Bookshelf
Humor in Magazines
Improvements in Office Devices

The Busy Man's Magazine

Montreal

Toronto

Winnipeg

New York

London, Eng.

The **James Robertson Co.**
Limited

Architects, Plumbers,
Builders and
all persons interested

*are invited
to inspect*

Our New Show Rooms

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Plumber and Steamfitter and Sanitary Engineer of Canada

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MONTREAL, TORONTO AND WINNIPEG, SEPT. 1, 1908

TIME TO DO SOMETHING.

In accepting office as Vice-President for Ontario in the National Plumbers' Association, George Cooper, of Toronto, says he will do his best to have a good report to make at the next annual convention. He will shortly issue a call for the trade throughout the Province to get together, the gathering to be held in Toronto probably on Thanksgiving Day, the first or third Monday in October.

'Harry Mahoney, Guelph, says he can guarantee a dozen or more delegates, and if the live ones in Ottawa, Peterboro', North Bay, Hamilton, St. Catharines, Niagara Falls, Galt, Brantford, London, St. Thomas and other places give even a slight measure of support to Mr. Cooper, success will crown his efforts.

Things could not be much worse than at present exist for plumbers and fitters in most parts of Ontario. Prices are cut to pieces and any jackknife carpenter can become a master plumber by hanging out his shingle. If the plumbers do not care for themselves they should at least have sufficient respect for their trade to endeavor to protect the public from the effects of cheap and shoddy work done by price-cutters and incompetents.

Matters will go from bad to worse unless the trade takes steps to organize. A better understanding must be brought about and a provincial code of plumbing regulations drafted. We bespeak for Vice-President Cooper the hearty support of the trade throughout Ontario.

NEED FOR TECHNICAL EDUCATION.

It is announced that the Premier of Ontario will look into technical education matters while in Europe, and it is a subject that will take a great deal of looking into.

Canada has been blessed by Nature with a great many things that if utilized will make it a great nation; but we are not always so quick to take advantage of our opportunities as we are to boast of their existence. It is not because a country is rich in natural resources that it becomes great. Greatness depends more upon the character of its people than upon any other factor in nation building.

Technical education builds up character, by awakening the intelligence and stimulating the creative powers of the youth of the country who come under its influence. This is not a supposition. It is a fact attested

by the experience of other nations and particularly Germany. The position that country has assumed during the last ten years among the industrial nations of the world is ascribed more to technical education than anything else.

In Canada we have made a beginning, and it is a very small beginning. Outside a board of trade or two and the Canadian Manufacturers' Association no body of men seem to be very enthusiastic over the subject. Even the educationalists, with few exceptions, are indifferent. Last year the inspector of technical education for Ontario, with a view to ascertaining what technical work was being done, sent a circular to the Public School inspectors in that Province. In his official reports he says that not 50 per cent. replied. This is certainly discouraging. And yet Ontario is doing more for technical education than any other Province.

Two or three years ago a movement was started to secure the co-operation of the Dominion Government. While supervision and care of education devolves upon the Provinces it is only proper that in a matter of such national importance as technical education assistance should be given by the Federal authorities. So far the most the Dominion Government appears to have done is to consider the advisability of appointing a commission to investigate and report upon this important subject. The matter has not yet gone beyond the consideration stage.

Politicians are usually slow to move in the direction of reform, but it is to be hoped that while abroad the Premier of Ontario will be so strongly inoculated with the technical education microbe that his enthusiasm will burn as a fever. In the meantime why should not another effort be made to inoculate the Dominion Government?

SYSTEM ESSENTIAL TO SUCCESS.

"Is the plumber a business-like man," is a question that is often asked and seldom answered but in the negative. Of course this does not apply to the large firms, whose methods of procedure are probably as systematical as those of any other big commercial concern. It is the jobbing man, and the man who undertakes an occasional contract who is the most at fault. Probably he thinks that his business is not large enough to necessitate any strict method of accountancy, or careful checking of stock, and of close attention to these many little things which contribute indirectly to his profit or loss.

Or it may be that he thinks that to carry on his business in a systematical way necessarily means a clerical staff, which in all probability he cannot afford to keep.

It is a common mistake, not only confined to plumbers, but found in other trades, that a business can be too small for strict organization. No concern is too small for organization. Only by very businesslike methods can a man hope to keep track of those little incidentals of his business which contribute to the success or failure of his enterprise.

To do this it is not necessary to have an elaborate set of books, or a system of check and counter check so essential in a large concern. But he can, we might say, with only rudimentary bookkeeping, keep complete track of his accounts, and what is equally important, keep check on his employes and on his stock. This would not necessitate a clerical staff. The plumber, given the desire, can probably find enough time to do it himself. Of course we do not mean to say that plumbers, generally, do not keep books and so forth, but what they lack is system. The accounts are often kept in a slipshod way and there is no real grip on this side of the business.

The result is that not only the employes grow wasteful with their materials and make no attempt to keep down the expense side, but accounts get involved, charges are not made that should be made, and a waste goes on that would keep back the most flourishing business. It is the waste that cuts into the profits so disastrously, and it is the waste that the average plumber fails to keep in check.

Let the plumber be he in a large or small way, remember that the greatest profit is founded on system, and that he who neglects organization and keeps not his hand on the pulse of his business is depriving himself of his full fruits of his hard work.

SHOULD INSPECT SCHOOL HEATING SYSTEMS.

The idea of employing school inspectors whose special duty will be to see to the proper operation of the heating and ventilating apparatus, has been proposed in several quarters recently, the latest city to take it up being Toledo, Ohio. In a recent report of the school inspecting committee of that city, which was approved by the local board of education, a recommendation that an inspector of general conditions in all school buildings be appointed was favorably acted upon. This is in line with recent comments made by the Heating and Ventilating Magazine upon the way heating apparatus in schools is interfered with, as shown in the manual of instruction on the subject issued by the New York City Board of Education, and the need of some measure that will prevent innocent or wilful interference with heating plants.

If, for instance, the operating engineer is so inclined, many and devious are the ways in which he can avoid strict attention to his duties. One of the commonest is the shutting off of the outside air supply in a plenum system of ventilation, but the tales that come up from the engine room might form a book by themselves, for that matter, one of the chief chapters of which would deal with the withering scorn for the designing engineer indulged in by some of those at the operating end.

However, under such conditions, and engineers know how frequently they prevail, it is obvious that the plant is not going to be run as the designer intended it should be.

Whether a special inspector will accomplish the purpose or not the point remains that the work of the designing engineer, so far as his reputation is concerned, is not finished with the completion of the job and that

it may be, and often is, damaged through no fault of his own but through circumstances entirely beyond his control.

OBJECT OF A PLUMBING BUREAU.

At the third annual meeting of the American Society of Plumbing Inspectors and Sanitary Engineers at Chicago in February, 1908 Winfield S. Reid, Chief Sanitary Inspector of Philadelphia, said in part:

"It is obvious that the primary object of a plumbing bureau is the protection of the public from disease and possibly death; in that respect its importance is second to nothing else. While the majority desire to perform their work in the best manner, others are tempted by cupidity to slight important details in the interest of cheapness. The administration soon learns who are the latter, and must exercise, if possible, a greater vigilance in inspecting their work.

"The successful administration of a plumbing bureau depends somewhat on the culture and intelligence of the inhabitants of the districts; where ignorance of the laws of sanitation prevails, evasion of legal requirements will occur; plumbing will be smuggled in without inspection and in gross violation of all sanitary principles, regardless of the vigilance of the officials.

"It should be, so far as possible, a duty of the administration to educate such persons in the necessity for proper plumbing, and point out the dangers from defective work. The question naturally arises as to how this is to be accomplished. In a number of ways information comes to us of places where violations have taken place. If we embrace the opportunity thus afforded to enlighten occupants of houses wherein violations of regulations occur, that such work is a menace to the health of themselves and families, and if we impress them with the fact that the inspector occupies his position exclusively for their protection, it will be found that these difficulties are more or less effectively overcome, and the knowledge they have obtained communicated to others. * * * The people as a whole are law-abiding, and it is no great difficulty, where they understand the motive of legal enactment, to secure that co-operation and confidence that are so essential to success.

"It must be remembered that there are just as honest men engaged in the plumbing trade as in any other business; that they desire honest work and honest competition; that many of them stand ready to render such assistance as they can for the success of a plumbing bureau. In fact, justice compels the statement that some of the laws that were enacted on this subject were brought about largely by the better element of the plumbers themselves, in order that a uniformity in construction and inspection of plumbing might be a legal requirement."

Sanitary regulations requiring careful work and close inspection are a public benefit not to be ignored, and the public looks to the plumber and inspector for the safest, best and simplest methods for the execution of all sanitary work in order that it may prove the most serviceable and be of the greatest protection to the health as well as a matter of convenience. The interests of the plumber, the inspector and public, undoubtedly are most mutual.

Cost of Heating Residences

Prof. J. D. Hoffman Discusses the Cost of Different Systems in an Address Before the Indiana Engineering Society.

The following discussion relative to the heating of residences by the different methods, and the probable cost involved is from a purely theoretical basis and overlooks several important practical considerations, which, if known, might have a decided effect in changing the result. Some of these points cannot be determined. Much depends, for example, upon the fireman. If he is careless about the time of firing and the amount of coal put in each time, the cost of heating will be greatly increased, at times even doubling the value it should be. From this one point alone it may be seen that the conditions over which the heating engineer has no control may make the system which he has installed an expensive one or the reverse. Other points may be mentioned, each affecting the yearly cost some of which are, character of the winter (cold or mild), efficiency of the furnace, and the quality of the fuel. Any figures, therefore, that may be presented, will assume certain conditions, and the results will be based wholly upon these assumptions.

The System Discussed.

Three systems of heating will be mentioned: Hot water, steam and furnace. The first and second will be direct radiation—i.e., having the radiator within the room and no outside air connections except through the opening of doors and windows, and the latter will be indirect radiation under three conditions of service: 1, When all the air is recirculated through the furnace and rooms indefinitely; 2, when only enough air is taken from the outside to provide ventilation; and, 3, when all the air is taken from the outside with no air recirculated.

Let the lowest outside temperature which will prevail in the district for any length of time be 0 degree F.; temperature of the rooms, 70 degrees F.; average temperature of the water in the radiators, 170 degrees F.; temperature of the steam in the radiators, 220 degrees F.; temperature of the entering air from the furnace to the rooms, 130 degrees F.; heating value of the coal, 14,000 B.t.u. per pound; efficiency of the furnace grate, 60 per cent.; 5 lb. of coal burned per square foot of grate per hour as an average; cost of coal per ton at the residence, \$6.50, and the average outside temperature for the heating year of seven months, 38 degrees F.

The last statement is taken from the bulletins of the United States Experiment Station at Lafayette covering the years from 1900 to 1907, as follows: October, 55; November, 41; December, 29; January, 26; February, 22; March, 38, and April, 51 degrees F., respectively.

Heat Loss From the Building.

Calculate the radiated heat loss from the building. Let this be for a 10-room house, 100,000 B.t.u. per hour on a zero day. This heat loss may also be understood to cover such loss of heat as is carried away from the building by the leakage of air through walls and windows. In addition to this heat loss 10 people may be occupying the building, each requiring, say 1,800 cubic feet of air per hour for ventilation. This air will be taken from the outside of the building and when heated for use will replace a corresponding amount of air within, thus causing a heat loss with the outgoing air of, cubic feet of air multiplied by T and divided by 55, equals B.t.u. per hour, as an additional heat loss; where T equals difference of temperature between the room air and that of the outside, and 55 represents the number of cubic feet of air that can be heated 1 degree F. by 1 B.t.u. From this it can be seen that the heat loss through ventilation on a zero day would be about 22,900 B.t.u. per hour, and on an average day of 38 degrees F. it would be slightly greater than 45 per cent. of this amount, or about 10,305 B.t.u. per hour.

Hot Water and Steam.

The expense of installing a hot water system would be greater than that of a steam system, because of the greater amount of heating surface and because of the greater care necessary in its installation. Very little difference, however, can be found between the maintenance costs of the two systems. What difference can be found is probably in favor of the hot water because of the ease with which it lends itself to moderate service in the spring and fall. In the average steam system enough fuel must be employed each time to raise steam before there is a transfer of heat, while in hot water heating a small expenditure of fuel will produce a circulation throughout the entire system. This

fact alone would be sufficient proof of increased economy.

Assuming the furnace conditions to be the same in each case, with a heat loss of 100,000 B.t.u. per hour, coal at 14,000 B.t.u. per pound and an efficiency of 60 per cent., it will require 100,000 divided by 8,400, equals 12 lb. of coal per hour in zero weather, or 12 multiplied by .45, equals 5.4 lb. per average hour to heat the building. This means 129.6 lb. per average day of 24 hr., or 27,216 lb. per average year of 210 days. At \$6.50 per ton this will be worth \$88.40, say \$88. The above figures assume that the entire house is kept at 70 degrees F. day and night for the entire season—an extreme condition that would seldom be maintained. It is not uncommon in practice, where the bedrooms are not kept at 70 degrees F., and where the temperature of the entire plant is permitted to drop during the night time, to have a residence the size of this one heated with a cost of only 60 to 75 per cent. of the cost as here estimated.

In hot water or steam heating where the direct indirect or the indirect heating is employed, air is taken in from the outside and passed over the radiator or in such quantities as to serve for ventilation purposes. This air is heated as it passes over the radiator and assists in heating the room. All air, however, that enters in this way replaces a corresponding amount of circulating air and incurs a heat loss as given under Furnace Heating.

Furnace Heating.

With all the air returned to the furnace for reheating, except what little escapes through the walls and windows, the heat loss from the building would be the same in this system as given for hot water and steam—i.e., 100,000 B.t.u. per hour—and the cost of heating, allowing the furnace to have the same efficiency as a hot water heater or a steam boiler, would be, as before stated, \$88.

When there is enough fresh air brought in to give ventilation for, say, 10 people on an average day, we have 18,000 cu ft. of air per hour exhausted from the room at 70 degrees F. and fresh air taken in at 38 degrees F., thus taking away from the building 10,305 B.t.u. per hour, which must be added to the calculated heat loss by formula, making a total loss of 45,000 plus 10,305, equals 55,305 B.t.u. per hour. Under

such conditions the amount of coal required per heating year is 33,183 lb., and at the same rate will cost \$107.83, say \$108.

When all the air is exhausted at 70 degrees F. to make room for fresh air, the amount circulated per hour—i.e., the amount exhausted per hour—is 45,000 divided by 60, multiplied by 55, equals 41,250 cu. ft. This is far in excess of the ventilation requirement, so would be considered satisfactory from that standpoint. In exhausting this amount of fresh air from the building we lose 41,250 multiplied by 92, divided by 55, equals 69,000 B.t.u. per hour. The amount of coal used per heating year is 24 multiplied by 210 multiplied by 69,000, divided by (.6 multiplied by 14,000) equals 41,400 lb., which at the above rate is worth \$134.50, say 135.

Summarizing the values obtained, we have:

1. Water and steam radiation for residence per year \$88
 2. Furnace.—All the air recirculated 88
 3. Furnace.—Air for ventilation, for 10 people 108
 4. Furnace.—All the air fresh 135
- Condition No. 3 would probably be the best arrangement for handling the furnace.

Grate Surface.

The amount of grate surface in the furnace is one of the important factors in any plant since the furnace is sometimes selected from this value. With a heat loss of 122,900 B.t.u. per hour as given under heat loss from building, and the other conditions as given under assumptions, the grate surface of this plant is 122,900 divided by (.60 multiplied by 14,000 multiplied by 5) equals 2.92 sq. ft., or a grate of 23.2 in. in diameter. The nearest standard size to this is 24 in. diameter, with an area of 3.14 sq. ft.

Cost per square foot of grate surface per year will be:

Cases 1 and 2, 88 divided by 3.14, equals \$28.

Case 3, 108 divided by 3.14 equals \$35.

Case 4, 135 divided by 3.14 equals \$43.

The residence under consideration contains 10 rooms of about 18,000 total cubic feet of room space exclusive of the basement and attic, hence the cost per year per 1,000 cu. ft. of volume is:

Cases 1 and 2 ... \$4.90 approximately.
Case 3 \$6.00 "
Case 4 \$7.50 "

Observations From Practice.

There is a great tendency toward having all the heat turned off from certain portions of the house, either through a desire to economize in the fuel bills, or to obtain outside conditions in sleeping

rooms. It is a very common practice also to bank the fires for, say, 8 hr. out of the 24, resulting in a decided fall of temperature throughout the house. All these conditions serve to reduce the amount of fuel used. It becomes, therefore, a very difficult matter to make a general statement upon the cost of heating. The following figures taken from observations will give a very fair approximation for the coal used per heating year as per case 2:

a. 1 to 1½ tons of anthracite coal per room heated.

b. 1½ to 1½ tons of soft coal per room heated.

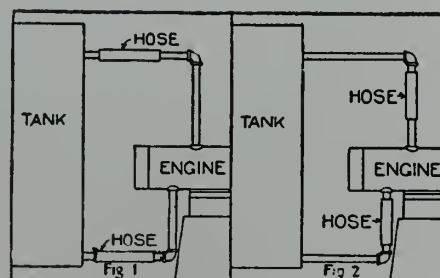
C. 4.5 tons of average coal per square foot of grate surface. These values lie between 70 and 80 per cent. of the theoretical values as given under summary of values.

FIBRE CLOSET SEATS.

Seats and tanks for water closet combinations modeled from what is called indurated fibre, have been brought out by the H. W. Johns-Manville Company, New York and Toronto. They are heralded as indestructible and are light in weight. They are finished to imitate natural oak, golden oak and mahogany, and are given a white enamel finish also, and besides the regulation seat and cover, complete with its fittings, both high and low tanks are built. A point of importance is that they are molded in one piece, so that in the case of tanks there are no joints to become unglued or to separate, and besides hardness and smoothness, it is claimed they are non-absorbent and are, therefore, not affected by moisture. It is emphasized also that the tanks are to be used without lining, being waterproof.

CONNECTIONS FOR GASOLENE ENGINE.

The ordinary method of connecting a cooling water tank to a gasoline engine is shown in Fig. 1. When pipe is con-



Improved Hose Connection

nected in this manner the hose will soon crack and become loose, caused by the vibration of the engine. Make the connections as shown in Fig. 2 and the hose will last indefinitely. — Popular Mechanics.

ONTARIO'S VICE-PRESIDENT.

George H. Cooper, the new vice-president for Ontario, is secretary of the recently organized Masters Plumbers' Association of Toronto, and is one of the best known members of the trade in Toronto. He served his apprenticeship with the John Ritchie Company



CHARLES TAYLOR, BRANTFORD,

Last Year's Vice-President for Ontario in the National Association of Master Plumbers.

Toronto, and afterwards worked for four or five years with Fiddes & Hogarth. For a time, he then worked outside of Toronto, after which he opened a shop on Berkeley Street, where he stayed for about six years, after which he moved to his present address, 113 Church Street, Toronto. Since he first entered business for himself, Mr. Cooper has been a member of the Master Plumbers' Association, being vice-president of the old association.

ROLL OF BILLS IN SEWER.

An unusual incident was the finding recently by a journeyman plumber of a considerable sum of money in a sewer pipe in Brooklyn. A stoppage necessitated expert attention and a plumber was called upon to remedy the difficulty. In locating the trouble he found a package of bills of various denominations in excess of four hundred dollars, and turned the money into the police station. The honest journeyman was made the recipient of a twenty-five dollar check, in a letter commending his action.

Kemptville, Ont., town council has passed a motion to issue debentures to the amount of \$6,000 for school purposes.

10

One more suggestion: When making up the items and sketching out plans and

with jobbing work, while contract work was again followed on Tuesday and Wednesday. It is a comparatively easy matter for a bookkeeper to follow up charge slips in which the material is re-

Remarks		Date
		Name
		Address
<u>ft.</u>	<u>"</u>	<u>sectional coverage @ 12 ft./ft.</u>
" 3'	" "	" .24 "
" 3'	" "	" .27 "
" 4'	" "	" .30 "
" 4'	" "	" .32 "
" 5'	" "	" .36 "
" 5'	" "	" .40 "
" 5'	" "	" .45 "
" 6'	" "	" .50 "
" 6'	" "	" .60 "
" 6'	" "	" .65 "
" 7'	" "	" .70 "
" 7'	" "	" .80 "
" 7'	" "	" .85 "
" 8'	" "	" .90 "
" 9'	" "	" .95 "
" 10'	" "	" 1.00 "
" 12'	" "	" 1.25 "
<u>Fittings as per itemized list = 1.53 70</u>		
# of Blocks	inch thick	for Boiler #
" "	" "	Tank "
" "	" "	" Smoke Bricks
" "	" "	" indirect stacks
" "	" "	" Heat Exch.
" "	" "	" Receiver
" "	" "	" cylinder
" "	" "	" Feed water Heater
" "	" "	" Pipe and Fittings
<u>Bags of Plastic Cement # Per Bag</u>		
Bags of Hard Pitch	" "	" "
S.S. Yds wire mesh	" "	" Yd
Gallons of Paint	" "	" Gall.
Yds of CS Cable	" "	" Yd
" "	" "	" "
<u>Extra Bands, Bolts Paste etc.</u>		
<u>Freight and cartage of Material and Tools</u>		
<u>Cost for workmen</u>		
<u>Traveling expenses</u>		
<u>Days labor @ Per day</u>		
<u>Supplies such as drain wire, Thread etc.</u>		
<u>Cost as above listed</u>		
<u>Percentage of Profit</u>		
<u>Extra material and labor</u>		

particular features of the work, do it on the blank side of the sheet, as it is of great importance sometimes to know some little detail you had in mind, but lost sight of.

In the complete set there is one sheet ruled the same as the sheet with the boiler, etc., but left blank between the lines, so it may be filled in with special data as required.

CHANGES IN LISTS OF BRASS GOODS.

The National Association of Brass Manufacturers has just issued the following circular letter to the manufacturers and jobbers of plumbing and steam supplies in the United States :

"The National Association of Brass Manufacturers fully realizing the inconvenience to the trade involved in changes of lists, but realizing, however, that changes must be made because of changing conditions, and having in mind the best interests of the manufacturers and jobbers of the country alike, are laboring for the establishment of uniformity in dates for these necessary changes.

"At a recent meeting of the Brass Association held in Toronto, Ont., it was decided that all changes in lists in plumbers' brass be made and published

Keeping an accurate account of all time spent on job work as well as on contract work is one of the essential things for the master plumber, and it is becoming more so as the rate of wages advances. One of the ordinary ways is for the plumber to hand in a slip after he has finished each job, and where there are a number of small jobs the firm cannot check for a half hour to an hour each day for time unaccounted for and time spent in the shop cleaning tools. The master plumber should receive from his customers pay for the full time the journeymen work.

In the accompanying illustration the Metal Worker shows a form of time slip used by a firm of master plumbers which is largely self-explanatory. This does not in any way constitute a charge slip, but is simply used by the plumber to keep track of his time, and what is more important, the pay roll is made up from this slip in conjunction with the foreman's time book. Spaces are left for each day in the week where the plumber can enter the customer's names for which he worked, giving a description of the job done, as well as the time consumed. As will be noted, James



TWO UNTIRING WORKERS.

Harry Knox and Harry Mahoney, Last Year's N.A.M.P. Secretary and Treasurer.

Rodgers worked on Saturday on a new contract for James Fitzgerald, 8 hours his entire time was taken up Monday

No. 200 James Rodgers

All time must be fully and plainly detailed.
This also must reach the office by Saturday morning 8 o'clock, otherwise it will not be paid till the following week.

	WHERE WORKED	ON WHAT	TIME HOURS
SATURDAY	James Fitzgerald 93 River St	New Contract	8
SUNDAY	James Bradley 18 First St	Fixing closet	2 1/2
	William Johns	New Range Boiler	4 1/2
	Reuben Thompsons house at 93 Seymour Street	cleaning kitchen walls	2
TUESDAY	James Fitzgerald 93 River St	New Contract	9
WEDNESDAY	James Fitzgerald 93 River St	New Contract	9
THURSDAY			
FRIDAY	William Whitehouse 23 Third St	New laundry bond	4
	Seymour Lewis 49 Broadway	Fixing two chests	5
		Total,	46 1/2

Time Slip for Plumbers' Use.

corded, making them check with this slip. It is also important to keep track of the time spent on contract work. While these blanks do not constitute a very essential part of the bookkeeping, they are convenient, and an excellent arrangement for promoting steady habits in the journeymen, and probably can be kept by master plumbers or sheet metal workers throughout the country with profit, as they are inexpensive to prepare and can be printed for a small cost in any job printing office.

COVERING MATERIAL FOR STEAM PIPES.

Rice flour, rye flour, cow hair, and beet-root molasses of each 1 part hoiled with 300 parts of water and gradually stirring the while, 86 parts of fossil meal (kieselguhr) added. The mass is applied in several layers so that at last a coating $1\frac{1}{4}$ inches thick is formed on the luke-warm pipes. The weight of a quantity sufficient for a surface of 40 inches square would be about 13 pounds, after drying, 3 pounds. The paste sold under the name of "steam economy" consists of 450 parts water, 40 parts of clay, 78 parts of fossil meal, 14 parts of cow hair, 7 parts linseed oil, 7 parts rye flour, 5 parts beet-root molasses.

M. Walsh & Co., plumbers, Montreal, have been registered.

Trapping Rain Water Leaders

William Hey, Plumbing Inspector, Portland, Oregon, Starts An Interesting Discussion on This Subject at the Last Convention of the American Society of Plumbing Inspectors.

Rain water should never be run to the house drain or sewer if it can be avoided, but should be run to street curb.

If rain water is run to the sewer or house drain and connected to the gutters of a building with tin or sheet metal leader pipes, then all leader pipes should be trapped, and traps should be supplied with fresh water from the nearest flush tank of a water closet.

If rain water is connected to the sewer or house drain with extra heavy cast iron or galvanized iron or steel pipes and connected to the roof gutters, by means of lead or copper drawn tubing, with wiped joints and brass ferrule or soldering nipple, and tested, when not within twelve feet of any window or air shaft, I see no reason for trapping them.

The main objection to connecting rain water leaders to the street sewer is the small capacity of many sewers. Such connections have often during heavy rainstorms filled the sewer, backed up into the basements of buildings and overflowed at basement fixtures. If the rain drain of building is connected to the house drain and the main sewer is too small, the same emergency will arise.

In cities where one system of sewers is maintained, the proper way would be to run to the curb, as the sewers would have more time to carry the rain water away.

Discussion by Other Members.

Mr. Cotter—In New York City rain-leaders are trapped and connected to the house drain. A running trap is placed inside the cellar wall, where it is at all times accessible, and in many cases this trap controls the yard and area drains. Our public sewers are sufficiently large to take care of the storm water in addition to the regular sewage. We do not supply the traps with running water, because we find no necessity for doing so. The traps are usually placed below the cellar floor, where very little evaporation takes place, and as we have no long spells of dry weather, as is the case in certain parts of the country, there is no occasion for supplying traps with running water.

Mr. Williamson—Will Mr. Cotter explain the manner of running rain water leaders in a tall building in New York City? Where are their connections taken from?

Mr. Cotter—In New York City there are two methods of installing rain-leaders, namely—inside and outside leaders. Which method is used depends on the slope and construction of the roof. If the roof slopes or grades toward the centre of the building (which is generally the case in high buildings), the inside method is installed. This consists of an extra heavy pipe of cast or wrought (galvanized) iron running down inside the building and connecting with the house drain in the cellar. A running trap is installed and is so placed in the cellar that it is accessible.

Outside Method.

If the roof grades towards the rear of the building, which it does in most cases (in buildings other than so-called skyscrapers), the rain-leader is carried down the outside wall of building by means of a corrugated pipe to within five feet of the ground, where it is introduced into an extra heavy cast-iron pipe which is properly trapped and connected to house drain.

Mr. Williamson—Is this the method you use in all cases?

Mr. Cotter—Yes. New York City might be compared to a whale's back. From the centre of the city the land slopes right and left towards two rivers and we have no trouble with overflow of main sewers.

Mr. Williamson—There is just one point that I am getting at. Do you use the house trap?

Mr. Cotter—We use the house trap in every case.

Mr. Williamson—Your connection for your rain-leader is taken off inside the house trap?

Mr. Cotter—Yes; towards the rear of the building.

Mr. Williamson—Where do you use your tile drains?

Mr. Cotter—Tile drains are rarely used, and when installed are drained into a sump from which the water is ejected by some kind of pressure pump.

Mr. Williamson—Is the same method employed in Brooklyn?

Storm Sewers.

Mr. Cotter—Yes. They have had some trouble with the overflow of some of the main sewers in Brooklyn, and the city has been put to quite an expense in the matter of suits for damages, but sewers of sufficient capacity to carry away all

storm water as well as other sewage are now being installed. In cities where the main sewers are sufficiently large, it is a great help toward keeping same properly flushed to have rain water from buildings pass through.!

Mr. Stolz—Mr. Cotter has my hearty support for the reasons he has advanced for the use of the house trap on private drains, as I am a firm believer in house traps. As for rain water leaders, there is nothing better than the flushing of rain water into a private or public sewerage system. As for back water coming from the rain water leaders, that can at all times be taken care of by either back water traps or valves. If a rain water leader can be so connected from tall buildings and away from all windows, then such a leader should be connected directly to the main sewer without any trap, that is to say, providing this leader is entirely outside of the building.

Mr. Shaver—In southern California, where it does not rain from the latter part of April to the middle of November, we do not consider it good practice to connect rain water leaders to our sewer system on account of the impossibility of retaining seal in the traps, on account of evaporation. The rain water is piped to the street gutters.

Sewer Ventilation.

Mr. McVea—In regard to the ventilating of sewers, I do not see any difference between an odor ten feet from the window or ten feet from the door. There are sewers in Omaha, Neb., that have not proper ventilation, and in the business districts it is necessary during business hours to muffle the sewers, because the odors that arise from these openings into the stores and business places are unbearable.

Mr. Harbison—Where does Mr. Cotter place his fresh air inlet, on the ground or above the roof?

Mr. Cotter—On the ground as a rule.

Mr. Harbison—At the curb?

Mr. Cotter—In a great many places they are at the curb; but in recent years a great number of patented fresh air inlets have been installed; they have to reach the outer air and are generally placed just outside the building line.

Mr. Harbison—Another question; You said that you did not believe that sewer gas accumulated in the house drains and

stacks where the house trap and fresh air inlet were installed.

Mr. Cotter—I said that no appreciable amount of sewer gas was generated where the house trap and fresh air inlet were properly installed and in working order.

Mr. Harbison—Then why do you trap each fixture separately if you have no such accumulation of gas?

Mr. Cotter—I said no appreciable amount of sewer gas. I did not say any. The fixtures are separately trapped to prevent even the slightest odor from entering the building.

Mr. Harbison—I don't know what you mean by "any appreciable amount."

Sewer Gas.

Mr. Cotter—I mean that there is no comparison between the amount of sewer gas generated in a plumbing system where the house trap and fresh air inlet are installed, and what would be in the same system without a trap or inlet, but where the sewer gas from the main sewer would be free to pass through the different stacks. I cannot understand how any practical plumber would countenance for a moment the abolition of the house trap in large cities where the inequality in the heights of buildings is so marked. Let us take a point of issue. In New York City, city lots are generally 25x100, some a great deal less. Now we will say we have a six-storey tenement on this lot, and a three-storey private house on the adjoining lot. The tenants in the six-storey building would be inhaling the sewer air from the main street sewer through the stacks in the four-storey building. This is only a fair case of thousands of conditions that exist in every large city in the country. There may be some ideal city where the houses are all of equal height and quite some distance apart. In my travels I met one such city, Pasadena, Cal., where the use of the house trap might with reason be left out, but it is against all reason to draw a general law from a particular case.

Mr. Luff—I had the privilege after the Washington meeting of going to New York and going around with Mr. Dewar, and I was particularly interested in fresh-air inlets. As I walked through the streets I pointed to the sidewalk and said, "Do you call that a fresh-air inlet?" The reason for that was the fresh-air inlet was completely stopped up. The sweepings of the sidewalk filled up the gratings, and I will lay a wager that over 50 per cent. of those fresh-air inlets are worthless.

Fresh Air Inlets.

Mr. Cotter—The statement just made by Mr. Luff does not change my position one iota. I did not say that all

fresh-air inlets in New York were in first-class working order. I did and do say that the principle is right. That they are not properly maintained in all cases does not alter the principle.

Mr. Ball—The committee in arranging its programme purposely left off the proposition of main traps, because some of us have very pronounced views on the subject. I am glad indeed to see that the world moves so that there are men who stand up here and say it is a safe thing not to have main traps. That is the position I took at the first meeting of the society, and I was practically without any support. There are, however, two or three things that ought not to go unchallenged as they have been stated here. With regard to the possibility of contamination of open drains into the sewer without house traps, is there any proof that there is genuine real danger of contagion being propagated from one house to another in that way? That is, in my judgment, one of the things that has never been shown. There has been a great deal of discussion and I have taken a lot of pains to see whether there was any support for that position, and I have never been able to find a man whose judgment I would accept who would say that there was practical danger. It is absolutely absurd to say that smallpox can be communicated in that way. There has been an investigation in this country in regard to the absorption of germs passing through a pipe which was wet, and it has been proved beyond the shadow of a controversy, it seems to me, by this investigation, that if you have twenty feet of 4-inch drain which is damp, or through which water is flowing, it is practically impossible to get any harmful kind of germ to pass up through that twenty feet; it is either deposited on the side of the damp pipe or it drops down into the flowing current. I do not believe anybody can prove there is any danger, because I believe it is shown to be impossible with the experiments that have been made.

Empty Traps.

Mr. Jennish—I would trap all rain water leaders in some way, but I have doubt of it doing much good in some seasons of the year when we have a long dry spell and the traps are no doubt empty. If a rain water leader could be kept tight and not get broken from freezing, or if it is made of soil pipe and run up through the building, or if it was outside of a building that was so constructed that no windows or doors came near it, I would consider it good practice to leave out the trap altogether, and thereby give one additional vent to the house drain. In some residence work in Waterloo, Ia., we have run some leaders through the wall and

discharged them into an open fixture, such as a slop hopper with a four-inch opening.

Mr. Quinn—What is meant by a plumbing fixture? Take a row of basins 12 or 14 feet long, what would you consider that, one fixture or ten fixtures?

Mr. Ball—It seems to me if you analyze what we mean by a plumbing fixture, you can get rid of Mr. Quinn's difficulty. A plumbing fixture implies a waste and a supply, and every one of the ten bowls has a waste and supply, therefore each one of them, it doesn't make any difference whether you set them in a circle, in a plank or slop, or in what manner, is a separate fixture.

What is a Fixture?

Mr. McVea—In regard to Mr. Quinn's remark, I will state that I have had experience in regard to that matter with the Union Pacific Railroad. I consulted the City Attorney of Omaha in regard to the matter, and he stated that any outlet of a discharge was considered a fixture. In the institution I refer to there were batteries of lavatories of about 175 bowls, wash rooms where the mechanics and laborers wash up. Each and every bowl was a separate fixture. Of course, a battery of closets with one outlet, no matter how many seats there were, was a fixture. Mr. Ball is correct. Each and every fixture should have a separate trap, so in our city of Omaha, Neb., if you have a three-part laundry tray or batteries of lavatories of three bowls, you must have three traps. I will state that that has been changed since the Union Pacific Railroad matter came up.

Mr. Luff—It might be interesting to the members to know how Mr. Eisenmann treated this proposition in the proposed Cleveland Code. One thing that you must take into consideration is this: Most of the rules and regulations give you a maximum length of distance from the fixture to the trap, and that is ordinarily, perhaps, about 2 feet. I know in most of them it is so and he treated it this way: In the three-part fixture the trap may be placed in the centre and the distance must not exceed that which is allowed for a single fixture.

Mr. Quinn—Last year when I was in Cleveland, I happened to go into one of the barber shops there, and I saw eight individual wash stands set the distance between the chairs of the barber shop all drained into one trap in the centre, that was not even ventilated. This barber shop is located only one block from the Hollenden Hotel.

Mr. Luff—You might find that existing at the present time. What I have stated was in reference to the proposed Cleveland Code. I must confess that that is very bad practice.

Sewage Disposal Without Sewers

Systems Being Installed in New Jersey Town Described by the Introducer of the Plan.

At Haworth, N.J., a suburb of New York City, are being erected a number of residences equipped with modern sanitary conveniences and provided with individual sewage disposal plants requiring no sewer system. The individual systems provided are a development of the so-called septic tank, and have already been referred to in these columns, particularly in a paper read before the American Society of Inspectors of Plumbing and Sanitary Engineers by the originator of the system, Burton J. Ashley, a civil engineer of Chicago.

General Description of System.

Briefly stated, the system consists in running the house drain into an underground tank, commonly of cast iron, where the liquefaction of the sewage is allowed to take place through the aid of the so-called anaerobic bacteria, and then of conducting the liquid into a so-called nitrification duct where the liquefied sewage is purified before reaching the earth surrounding this duct. The excavation made for the cast iron tank and for the trench extending along one side of the house is continued parallel with the front of the house, the trench to accommodate the nitrification duct. This merely consists of two lines of tile pipe, laid with broken joints and both imbedded in broken stone or similar material, one tile line about 12 in. above the other. The upper one is connected with the outlet from the tank. The lower of the two tile lines is employed as an air duct and at its discharge end is connected to an air inlet grating in some inconspicuous place in the sidewalk or in the lawn. This is an arrangement for providing an air circulation essential in the second process of the purification of sewage which demands the activity of aerobic bacteria, the class that needs air for their existence. On account of the open and porous nature of the broken stone medium between the tiles and that the upper pipe will only have a stream of liquid in its bottom, it is the scheme of the system to allow for a movement of air from, say, the inlet grating through the lower tile pipe, thence through the broken stone medium—which, of course, provides a large aerating surface to accelerate purification—into the upper line, thence into the upper part of the tank and finally by way of the house drain and the vent stack into the outer atmosphere above the roof. Obviously the relatively warm tempera-

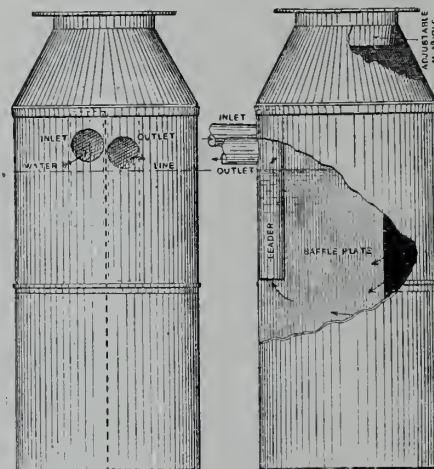
ture of the plumbing system in the house will assist in bringing about the desired movement of air.

After the tile pipes are imbedded in the broken stone a thin mattress of salt hay or other material is used before the earth is thrown back into the trench, as a means for keeping the earth from reaching and clogging the spaces between the broken stone. The tanks as installed in the Haworth residences are built in sections, which fact facilitates installation, and when the job is finally completed nothing is visible, the trench being covered with the lawn and the tank being located only by a manhole cover flush with the ground surface. No attempt will be made to outline sizes,

tank is added a further supply of concrete in order to insure a watertight bottom.

With the tank comes an inlet and an outlet fitting passing through holes provided in the tank, as indicated in the drawing and shown in the pictures. These two fittings are practically tees and the inlet one is located slightly above the outlet. Both dip below the surface of the liquids in order not to agitate the floating material on the surface and the upward pointing outlets of the fittings allow for a freedom of the movement of air from the outlet of the tank into the air space of the tank and thence into the inlet fitting and so into the house drain and the vent of the plumbing system. The two fittings lie on opposite side of a diaphragm or baffle plate. This is to prevent an immediate admixture of the incoming fresh sewage and that partially purified and liquefied.

A characteristic of the biological process of sewage purification, as mentioned numerous times in these columns, is the existence of a floating mat which carries such grease as may have entered with the sewage from the kitchen sink and which also is a provision of nature shutting out the air and thereby giving the anaerobic bacteria the chance to survive over the aerobic. Similarly insoluble matters, such as mineral matter, like sand, which may enter the water supply, fall to the bottom of the tank; but in the average case this is said to amount to very little ever over a period of years. The provision of the manhole means that access can be had to the tank at any time to remove the mineral matter and sludge collecting in the bottom. However, no attempt will be made to explain in detail the question of sewage purification for the household or of the characteristics of the Ashley system, but instead the following explanation written by Mr. Ashley himself will give the information at first hand.



Two Elevations of Biological Tank.

the pictures sufficing to give a general conception of the work. The conditions of the character of the soil, the topography of the site and the size and character of the occupancy of the building govern to a large extent the detailed figures, which are given by the company which Mr. Ashley has established to authorize and govern its installation.

Detail Parts of System.

An accompanying diagram will serve to indicate the general features of the tank. The main body is substantially a large iron pipe, built in two parts, one fitting into a flanged recess of the other. The third or top part brings the top of the tank to the ground surface. After the excavation for the tank is made, concrete is spread over the bottom of the excavation, and the iron pipe constituting the tank is then lowered in place. Over the concrete bottom and within the

Explanation of Process.

The sanitary conscience of the United States is on the ascendency. Various States are passing rigid laws to prevent the further contamination by sewage of fresh water streams. Epidemic diseases are no longer regarded as dispensations of chance and Providence, but are now being regarded as being preventable, and their prevalence dependable on the absence of strict obedience to sanitary laws or their absence because of obey-

ing the laws of cleanliness and sanitation.

The tendency of the higher order of city dwellers is to get back to the country to live, where their families may be reared under incomparably better conditions than can be afforded in the congested city, so that the suburbs of our great cities will soon be the location of the ingathering of the well to do families. The wife and children want some soil to dig in, to plant flowers or to garden in, where growth and bloom are not smothered and blackened by gaseous smoke, but they want all the household conveniences, such as lavatory, bath, sinks, laundry tubs, water closets and the like, the same as the city afforded.

Sparsely settled or isolated localities are almost always without sewers or public water supply, and because of this the would-be country dweller has a problem on hand. The water supply he can secure by drilling or digging a well and building a storm water cistern, but that is not enough; he wants it delivered into his kitchen and bathroom under pressure, just like the city mains do, and he wants it hot or cold, so he erects a windmill and tank over his well, or he may put a compression tank and pump in his basement, and the pressure problem is solved. Then he installs a hot water heater, and the water temperature problem is solved. Since both of these features are mechanical propositions pure and simple, their acquisition is merely the matter of cost and the labor of erecting them, and then our suburban friend has a water supply equal to if not better than the service he had in the city, but when he has used the water, he has produced one of the most foul and dangerous substances known—sewage—and the greatest problem of all confronts him: Sewage disposal.

Cesspools Dangerous.

Contrivances of every conceivable character have been tried and used, the cesspool being the most common. This dangerous, expensive and offensive makeshift hardly needs to be written or talked about to impress one that it is dangerous, expensive and offensive. A user of one of these cesspools has recently written that it costs him \$15 per month to maintain. Now this is at the rate of \$180 per year, and \$180 is 6 per cent. on a capital of \$3,000—pretty expensive, indeed, saying nothing of the offense nor dangers. But these dangers, offenses and expenses can be overcome in a very large majority of the cases where the country dweller desires all the comforts of modern living and safety from disease. These sewage wastes can be reduced and purified and in a variety of ways disposed of on one's own premises in a perfectly sanitary manner.

Only in very recent years has the

nature of ordinary decomposition of organic substances been understood, but Pasteur and Koch, by much research, discovered and determined the kinds and uses of micro-organisms which are present in fabulous numbers in all decay and decomposition and learned the functions they perform. But few of our readers have not noticed the disappearance of a decaying carcass of an animal until nothing but bones are left. The question is, what becomes of the fleshy part? We answer, that Nature has provided laws of disintegration and decomposition by means of which these substances will liquefy and give off gases to such an extent that the real residue or solids left after the completing of the process of decay is hardly worth speaking of, but in order to bring these natural forces to their highest efficiency, any decaying mass should be given the very best conditions in order to intensify and hasten the operation and carry it to its fullest completion. You throw a pailful of coal into the stove and shut the doors and draughts, and the combustion is poor; give it draught and you better the condition and intensify results, but you would not expect to get results by putting two pailful of coal under a 40 h.p. boiler and firing it. So it is in designing a plant for the disposal of domestic sewage.

These sewage disposal plants have something to do with capacity as well as with the micro-organisms or bacteria that operate in them; in fact, the designing of such plants can only be correctly done by persons versed in the principles involved in natural decay and decomposition and the various means that must be created to intensify the operation.

Limitations of Septic Tank.

What is commonly termed the septic tank is one of the appliances used in the process of sewage disposal. Soon after the discovery of this means to hasten decay, very extravagant claims were made regarding its capacity to purify and to entirely do away with the sludge problem, but experience has very clearly revealed to investigators that the septic tank does not accomplish more than from 20 per cent. to 30 per cent. of the work necessary to complete purification and of itself never did completely purify sewage and never will.

A secondary process is absolutely essential to complete the work, viz.: Nitrification or oxidation, and is that process in nature that is in continuous action in the surface of soils converting decaying matter back into original elementary compounds again ready to feed and nurture plant life. The converting of common stable manure back to its original elements is an example of nitrification, and is accomplished by the agency of microbes and air. This class of microbes

are called aerobic bacteria, or bacteria that live and thrive in the presence of air.

Anaerobic bacteria is that class of bacteria that thrives without the presence of air, and it is this class that does work in the septic tank or biological tank. Anaerobic bacteria are the agents of putrefaction, while aerobic bacteria are not. Yet each class performs an important and specific work, the anaerobes to aid in liquefying the solids and the aerobes in purifying the liquids so produced, the real purification being the second or nitrifying process.

Operation of the System.

Mr. Ashley worked out his process largely at his own suburban home, subsequently giving the subject of biological sewage purification and disposal study, research and experiment, and evolving his nitrification duct, where final purification is accomplished before it is given to the earth to absorb. This system is composed of a biological receiving tank, with interior baffle wall properly located but not so as to divide the tank. The tank is intended for the three-fold purpose of sedimentation, putrefaction and a limited amount of nitrification. Before the sewage is allowed to reach advanced stages of putrefaction, it flows from this receiving tank into the nitrification duct, where it is divided and percolated through granular material and subjected to the purifying influence of fresh air, and by reason of which the poisonous nitrites in the tank liquid are speedily changed to harmless nitrates, the nitrogen and carbonic gases are freed and the liquid filtrates become water. This resultant liquid is then absorbed by the soil in which the nitrification duct is constructed, or by a unique relief filter is allowed to surface irrigate the ground.

The filtrate is without odor or color, and is purer than some of our fresh water streams or lakes. No chemicals are required in the biological or bacterial processes, for the use of chemicals would kill the bacteria and produce the very opposite results to be aimed at. It is the lively cultivation of bacterial growth that produces the desired results. The Ashley plants are entirely under the ground and unseen, can be placed under the front lawn as many of them are, and its presence there would never be known. There is little or no attention required in its operation, but no cost. The sludge that accumulates in the bottom of the tank accumulates so slowly as not to require removal more than once in from two to five years, and then the sludge only needs to be taken out as the entire contents need never to be removed. The sludge may be brought up by means of a common wooden pump stock and suck in a few minutes' time, and in an in-

offensive way. The sludge may be deposited around trees or on the garden for manureal purposes, although the excessive decomposition it has undergone reduces its manureal value considerably.

As the nitrification ducts are designed to have a capacity sufficient to permit the earth to absorb all the fluid wastes of the household, no outlet is ordinarily required, and since the quantity of sewage daily produced in any one household is so limited, sufficient area around the house is almost always available for disposal purposes. Since these plants complete the purification by carrying it entirely through both the anaerobic and aerobic processes, the filtrate or final product is without odor. In fact, when the tank is working properly, the cham-

ber above the liquid is so thoroughly aerated that no offense can be detected even in the very top of the tank, even within a few inches of the scum or mat which almost always forms on the top of the liquid.

The Ashley system, Mr. Ashley emphasizes, will work on perfectly level ground when the plants are from the small to the ordinary in size, and, therefore, is capable of being adapted to widely varying conditions so far as the topography or lay of the ground is concerned. Since the plants do not necessarily require any working parts or mechanical devices, the cost of building them is quite within the reach of the middle to well to do classes, or such as are able to own their own homes.

perly vented to insure perfection in sanitation.

F. R. Maxwell, of Maxwell-Johnson, Toronto, says his experience has been that the "w.e." does not require any ventilation when on a straight stack or connection taken off close to stack. The bath and lavatory in every case should be ventilated, as nine times out of ten both connections are taken off the one piece of pipe and close together, and are liable to syphon one another, which I have seen occur.

J. E. Farrell, North Bay, gives the following as his personal opinion:

"One w.e., one bath, one lavatory and sink, makes a complete plumbing job, regardless of what ventilation the room might have, and I contend it is necessary to back vent the traps, unless traps so constructed that it would be impossible to syphon them were used. As yet there is no set standard of requirements for this sort of traps. Of course, the location of such a job would make some difference. If it were a country house the use of non-syphon traps might be satisfactory, and there would be much less sewer gas to guard against. If it were in a city of 12,000 population or up, there being a greater quantity of sewer gas held in check in sewers to guard against, the only safe way to instal such a job would be to back vent it. And the old saying holds good here, that an ounce of prevention is worth a pound of cure, so that should there even be one case of sickness lasting only one week, due to sewer gas entering the house, for lack of back venting, its cost would very much more than pay for the back venting of such a job, and it is a most perfect and sure method of installing plumbing.

NO NEED TO HURRY.

Down in Montreal during the recent Master Plumbers' convention, Harry Mahoney, of Guelph, was walking along the street when he met a little boy, who asked him the time.

"Ten minutes to nine," said Harry.

"Well," said the boy, "at nine o'clock get your hair cut." And he took to his heels and ran, with Harry after him.

Turning the corner, Harry ran into a policeman, nearly knocking him over.

"What's up?" said the policeman.

Harry, very much out of breath, said: "You see that young urchin running along there? He asked me the time, and I told him, 'Ten minutes to nine,' and he said, 'At nine o'clock get your hair cut.'"

"Well," said the policeman, "what are you running for? You've got eight minutes yet."

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

DISCUSSION ON BACK VENTING.

J. H. Prichard, Summerside, P.E.I., and recently with W. E. Ross, Saskatoon, asks the following question to settle an argument:

"Is it absolutely necessary to back vent when there is a straight stack, and only one closet, bath and lavatory, on second floor, with lots of ventilation in room, and sink in kitchen, the average length of stacks being about 30 feet?"

Syphonage Unseals Traps.

"K," Toronto, in answer to the above question, says:

"Yes, as soil and waste pipes are usually fitted the bath tub will unseal the traps of wash basin and sink, while the water closet will unseal all traps with the possible exception of its own, assuming, of course, that the soil pipe is continued through the roof. 'Lots of ventilation in the room' is in itself always desirable and necessary, but it cannot wholly neutralize the pollution resulting from unsealed traps. It has long since been demonstrated and is now universally acknowledged, that unvented traps become unsealed by syphonage. I do not, therefore, feel called upon to offer any explanation as to the action of syphonage."

George Clapperton, Bennett & Wright, Toronto, says he might answer this question in a very few words, by saying: "If a w.e. is a wash-out and the traps of the bath, basin and sink be the ordinary drawn trap, he would say that all should be back vented.

"The experience of his firm is that where the w.e. is of syphon jet construction and placed within three feet of the stack, it is not necessary to back vent same, but if placed beyond this distance the same should be back vented. The reason for this is, any branch taken off the main soil pipe with a dead end, has no circulation, and this branch remains full of foul gas unless the fixture is used.

"In the case of the syphon jet closet it is only by having a large quantity of water in the bowl that prevents the foul gas from coming into the room.

"He thinks it absolutely necessary to back vent traps of bath and basin, not that they would syphon, but for the simple reason that this branch being longer than three feet (sometimes being six feet long), the gas bottled up in this branch would, unless these fixtures were often used, percolate through the water in the traps."

Mr. Clapperton firmly believes in back venting all fixtures as a sanitary method of precaution, except in the case of syphon jet closets mentioned.

Harry Mahoney, Guelph, expresses his opinion as follows:

1. If the waste from bath and basin are connected to the closet bend, then it is absolutely necessary that the bath and basin traps be vented.

2. An anti-syphon trap may be used on sink, but a trap properly vented is considered perfect sanitation.

3. If the waste from bath and basin are connected to a 4x4 T Y with 2 in. side opening for bath and basin waste, then anti-syphon traps can be used, but, in my opinion, all traps should be pro-

Window and Interior Display

ATTRACTIVE SAMPLE ROOMS.

The offices of the Dominion Radiator Company, on Craig Street, Montreal, are well suited for the display and storage of the products of the company's

window display recently, fixing up a "Merry Widow" hat calculated to do credit to a milliner's window. It consisted of a sponge bath, turned upside down, a drape of oakum, plume of tin,



The Dominion Radiator Co.'s Montreal Sales Rooms and Offices.

foundry, as the accompanying illustration shows, all styles and types of radiators being shown in an attractive manner. Back of the display are the offices of Manager J. B. Morris and staff, while in the rear are the rooms for storing boilers, radiators and other heating supplies.

ROBERTSON'S FINE SHOWROOM.

The James Robertson Company, Toronto, have been preparing a surprise for their customers and "took off the lid" last Saturday. Visitors to Toronto Exhibition will, therefore, be able to enjoy seeing one of the finest sample rooms in the country if they call at the company's headquarters on King Street West. The old saw factory has been removed and large windows installed, a large space being made available for showing bath tubs, lavatories, closets and other fixtures. At night the room is a blaze of light and the effect is startling to everyone who passes on the Belt or King West cars. H. S. Harwood, general manager, and John M. Owston, sales manager, are to be congratulated on the improvement made.

An exhibit of plumbing supplies is also being made by the company in the Process Building at the Exhibition grounds.

"MERRY WIDOW" HATS.

Phillips & Co., plumbing contractors, and stove dealers, Orillia, made a unique

rosette of tin and N.P. floor plate, buckle of tin, feather duster, etc., with stove door knobs for hat pins.



WHO WILL WEAR THIS "MERRY WIDOW" HAT?

Novel Window Display Made by Phillips & Co., Plumbers and Stove Dealers, Orillia.

The display attracted a lot of attention and was one of the best advertising stunts ever done by the firm.

TORONTO GETS ENAMELWARE PLANT.

Word is expected daily from Pittsburgh as to which one of three Toronto sites will be chosen by the Standard Sanitary Manufacturing Company, for their new Canadian plant.

Messrs. Torrance, Myler and Dawes, executive officers of the company, were in Toronto during the past fortnight and in company with a few friends connected with the trade in Toronto, made a tour of the city looking over available factory sites. Toronto has been definitely chosen over Montreal for the location, and in all probability a site in the northwestern part of the city will be selected. In this section the King Radiator, Dominion Radiator, Pease Foundry, Somerville Brass, General Brass and other concerns are already located.

The Standard Sanitary Manufacturing Company intend to rush work on their new plant and have it in operation for next summer's trade.

PRACTICAL SUGGESTION.

David Whiteford, chairman of the Sanitary Committee of the Chicago Master Plumbers' Association, has suggested the use of running water for consumptives to expectorate in as a substitute for the unsanitary cuspidor. He believes that hospitals for consumptives should be equipped for the patient with

receptacles similar to those used in dental offices as a precautionary measure against the spread of disease.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

An Anglican Church will be built at Blucher, Sask.

A new fire hall will be erected at Chilliwaick, B.C.

The Freeborn School at Stratford will be re-built at once.

Tenders are called for a post office building at Welland.

Tenders are asked for the new school at Ninga (Winnipeg).

A Sunday school hall will be erected at Campbellton, N.B.

A \$25,000 addition will be built to the Toronto post office.

The Baptist Church, York Mills, Ont., will build a new edifice.

An addition will be built to the school at Marble Mountain, C.B.

Work has been commenced on the new Dental College at Toronto.

The Government will erect an immigrant hall at Wilkie, Sask.

St. George's Church, Owen Sound, will enlarge and alter its building.

A sanitarium and academy are proposed to be built at Lacombe, Alta.

A two-roomed school will be erected in the Carriek addition of Port Arthur.

New G.T.R. stations are being built at Vars, Ont., and at St. Louis, Quebec.

A Government building will probably be erected at Grand Forks, B.C., shortly.

St. Clement's Mission Church, Toronto, will build a church and pastor's house.

Dundas Town Council is calling for tenders for the erection of its new High School.

A new Knox Church is being built at Lethbridge. The building will cost \$30,000.

Tenders are called for the new Presbyterian Church to be built at Fort William.

The plans of King Edward School, Winnipeg, call for an expenditure of \$63,000.

The ratepayers of Calgary have carried a by-law to raise \$20,000 for a public library.

An addition to the public hospital at Banff is being considered by the Board of Directors.

St. Mark's Presbyterian Church, Toronto, is considering the erection of a new building.

The Armory Hall, Elora, will be entirely renovated, and a new heating system installed.

Work has commenced on the new Government buildings and courthouse at Prince Rupert.

Holy Trinity Church, Vancouver, has purchased four lots for the erection of a larger church.

The I.O.O.F. will erect a Temple building at Winnipeg this fall at a cost of about \$150,000.

The new building for the Faculty of Education for the University of Toronto is to cost \$400,000.

New schools will be built at Fenelon Falls, Ont., Grand Falls, N.B., Lang, Sask., and Pieton, Ont.

The Icelandic Lutherans, of Winnipeg, Man., will erect an academy there at a cost of about \$20,000.

The Fergus School Board will ask the Council for \$2,900 for the Public and \$1,900 for the High School.

Additions will be made to the Park Drive and Hastings Street Schools, Vancouver, at a cost of \$12,600 each.

A by-law has been passed by the ratepayers of Brownlee, Sask., to raise \$8,000 for the erection of a Public School.

Hamilton proposes to submit a by-law to the ratepayers asking for \$20,000 to erect a hospital for incurable consumptives.

Edward Cook has been awarded the contract for the addition to Christ Church, Vancouver, which will cost \$20,000.

F. A. & G. A. Mann have been awarded the contract for the erection of the new fire hall at Saskatoon, for the sum of \$14,100.

The Armory Hall, Elora, Ont., will be extensively improved, a new heating system installed and the building re-roofed and re-floored.

A new brick school building will probably be erected at Fredericton in place of Regent Street School, at a cost of \$7,000 or \$8,000.

A sanitarium will be erected at Brokenhead River, thirty-five miles east of Winnipeg Man., on the National Transcontinental Railway.

St. Matthew's Evangelical Lutheran congregation, Brantford, have secured property upon which they will erect a \$6,000 church building.

The General Engineering & Construction Company are making additions and alterations to Glencoe Lodge, Vancouver, at a cost of \$50,000.

The Provincial architect at Edmonton is preparing plans for the new University building. A residence will also be built for the President of the Faculty.

The Ottawa Separate School Board has approved of a four-roomed addition to the Catholic Lyceum. Two more rooms at St. Roch's School may also be added.

The Dominion Government has voted the sum of \$40,000 for the erection of an immigration building at Victoria. It is estimated that the building will cost \$91,180.

The Dominion Government has voted the sum of \$30,000 for the erection of a new post office at Fernie, B.C. It is estimated that the building and site will cost \$66,000.

Walter Nash, Toronto, has been granted a permit for the erection of five pairs of two-storey semi-detached brick dwellings, at cost of \$22,500.

William McCartney has been awarded the contract for the new orphanage building for the House of Providence to be built at Kingston. The building will cost about \$50,000.

Rhodes, Curry & Co., Amherst, N.S., have been awarded the contract for the new Carnegie Science Building, to be erected in connection with Acadia College, Wolfville, N.S.

The ratepayers of New Westminster have passed by-laws to issue the following debentures: \$35,000, for public schools; \$6,000, for market extension; \$6,500, for fire halls.

Architects Watt & Crane, Windsor, have been commissioned to prepare plans for a new eight-room school building at Amherstburg, to be erected at a cost of approximately \$25,000.

The Halifax Board of School Commissioners are asking tenders for the erection of a concrete or brick school building on Chibucto Road. The new building will probably cost \$75,000.

Hooper & Watkins, architects, have been instructed to prepare plans for a new ten-roomed school in the northern portion of Victoria. The appropriation for the building is \$50,000.

Plans have been prepared for a two-storey, eight-room, school building to be erected at West Toronto. The building will have open plumbing, and steam heating and ventilating systems.

The contract for plans and specifications for the new brick schoolhouse at Woodstock, N.B., has been given to Harry H. Mott, St. John. The building is to cost between \$20,000 and \$25,000.

T. R. Nickson & Co. have been awarded the contract for the construction of the Grandview and Macdonald Schools, Vancouver, at a cost of \$12,600 each. Baynes & Horie will build the Kitsilano School at the same place for \$10,750.

Robertson & Sons, Toronto, have obtained the contracts for the new thermodynamic building and the botany and forestry building for the University of Toronto. The estimated cost of the former is \$100,000, and of the latter \$28,000.

The St. John Board of School Trustees have accepted the tender of R. A. Corbett for building the new annex to Winter Street School. The contract price is \$33,868. The building is to be finished and ready for occupancy July 1, 1909.

The building trade is busy at Saskatoon. Good progress has been made on the new post office; Soldan & McLaughlin are building a warehouse; W. J. Bell an office; Great West Furniture Co. a new warehouse; H. W. Way a

residence, and many smaller structures are being erected.

Building permits recently were issued at Victoria to Cameron & Clarke, for a house on Fairfield Road, to cost \$2,800; to McPherson & Fullerton, for a house on Rudlin Street, to cost \$1,850, and to Mrs. McGavin for a residence on Niagara Street, the estimated cost of which is \$730.

General Building Notes.

A. Nadeau, Quebec, will erect a \$6,000 dwelling.

Lewis & Sills will build a \$40,000 store at Vancouver.

J. Walker, Vancouver, is to build a \$7,500 residence.

Jas. Curran, Peterboro, will put up a \$9,000 dwelling.

R. Doherty, Toronto, is building a \$10,000 residence.

P. Bossny, St. Boniface, Man., is putting up a building.

E. S. Rutledge is building a \$2,400 residence at Fort William.

R. J. Smith, Toronto, will build some stores at a cost of \$10,000.

Symons & Ruel will build a \$50,000 apartment house at Toronto.

C. D. Warren, Toronto, is spending \$12,000 on a dwelling house.

Mrs. M. B. Elliott, \$1,500, and F. O. White, \$1,850, are building at Victoria.

The Vancouver Construction Company will erect a block at that place to cost \$25,000.

The Eastern Townships Bank will likely put up a new building at Grand Forks, B.C.

The Hotel Sanita, Chatham, Ont., is to be extensively improved and an addition will be built.

Wildfong & Wirsching, Guelph, have been given the contract for the erection of a residence at Preston.

A new hotel will be built at Kingston, if the citizens vote \$75,000 for it, the balance to be provided by capitalists.

E. Cook, Vancouver, will soon commence the erection of a business block for himself at a cost of about \$60,000.

William Baxter, Hamilton, has been granted a permit for the erection of five brick dwellings at a cost of \$10,000.

Tenders will be called early next month for the construction of the Bell Telephone Co.'s new building at Toronto.

The Trustee Board of the Methodist Church, Preston, will expend \$500 on improvements and heating in the parsonage.

McDougall & Secord, Edmonton, have let the tender for their new business block to McSparran & Co. The cost will be about \$40,000.

K. M. Chadwick has been granted a permit for the erection of a three-storey brick apartment house at Toronto, at a cost of \$15,000.

A. D. Westman is building a \$4,000 residence; W. H. Taylor a \$3,400 dwelling, and J. J. Tremblay a \$2,000 building; all at Chatham, Ont.

Ald. Mitchell, Fredericton, obtained the contract for the new warehouse for Randolph & Sons, Fredericton, to be erected at Chatham, N.B.

Plans have been presented to the building inspector, of Vancouver, for a six-storey hotel, to be built by Bauer & Harrison. Plans are also ready for a three-storey apartment house.

John Leckie, Toronto, has applied for a permit to erect a five-storey warehouse at 75-77 Wellington Street West, for conducting his wholesale chandlery business.

The following persons are building residences at Brantford: D. Gardner, \$1,200; Jas. Lake, \$1,000; Geo. Myers, \$1,900; Thomas Sears, \$1,000; Daniel Smith, \$1,100; Ross A. Patillo, \$1,100.

The New Brunswick Tourist and Hotel Company has purchased the old Baptist Seminary at St. Martins, to which it will make extensive alterations and improvements. The building will be opened for hotel purposes next summer.

The following will have been granted building permits at Ottawa. Charles Rupert, \$5,000; John L. Garland, \$4,000; Alphonse Rheume, \$5,000; Dr. Winter, \$4,000; Rodger Beattie, \$2,000; C. Nelson, \$2,000; Charles T. Routh, \$3,500; T. A. Magee, \$2,000; W. H. Murphy, \$2,000; Joseph D. Wilson, Edmond Gauthier, \$2,500; Mrs. Hallinan, \$7,000; William Cope, \$1,500; E. R. Whitehead, \$8,500.

The following firms and persons will re-build at Three Rivers almost immediately: Bell Telephone Co., Estate Bergeron, I. Z. Beaudry (three buildings), C. Corigan & Fils, Chas. Page, Louis Bordeau, I. M. Spenard, Bellefeuille & Giroux, H. Catrig, P. Robichon, Lucien Lajoie, Mme. Napoleon Lajoie, J. R. Dupond, Drolet & Lassonde, H. Godin, R. W. Williams, J. A. Fortin, J. A. Gouin and T. E. Panneton.

Waterworks and Sewerage.

Elmira, Ont., will spend \$25,000 on extensions to their waterworks system.

Sewer and waterworks extensions will be commenced shortly at Port Arthur.

Ottawa's new waterworks pumps were given a satisfactory test recently.

Work on Fort William's sewerage system extension has been commenced.

The Natural Gas Co. promise to supply Calgary with natural gas by Christmas time.

Calgary ratepayers have passed a by-law authorizing the extension of the sewerage system.

The Winnipeg Board of Control has ordered the installation of a number of sewer connections.

It is probable that a water system will be installed at Melbourne, Que., in the immediate future.

The citizens of Hamilton will vote on a by-law to spend \$90,000 for extending the waterworks system.

The Chilliwack, B.C., Township Council have been empowered to borrow \$17,000 for drainage construction.

The Halifax City Council will borrow \$35,000 to carry out improvements to sewers and permanent walks.

Extensions to the water and sewer services at Irishtown Crossing, Moncton, N.B., will soon be undertaken.

Brantford water commissioners have decided to make extensive repairs and changes at the pumping station.

The contract for 4,200 feet of cast iron water pipe for Oak Bay, B.C., has been awarded to W. G. Winterburn.

Two Chatham gas companies are likely to be given franchises for a pipe line to Blenheim for the purpose of creating competition.

Satisfactory progress is being made with the erection of the waterworks extensions at Guelph. The standpipe is fast nearing completion.

The sanitary sewerage system being constructed at Brantford is nearing completion. When finished, work on the storm sewers will be commenced.

Tenders for water mains at Moncton, N.B., were awarded to D. T. LaBlanc at a cost of \$481.76. The Sumner Co.'s tender for pipe at \$34.40 per ton was accepted.

A sedimentation basin, in connection with the Saskatoon waterworks, will be constructed and tenders will soon be called for the work. A new engine and generator will be added to the plant.

The Concrete Engineering & Construction Company, Toronto, have been awarded the contract for laying the sewers at Preston and the Canadian General Electric the contract for the pumping apparatus.

The Dartmouth (N.S.) Town Council has decided to purchase the following supplies for water and sewer extension: 2,000 feet of lead lined iron pipe for house connections; 25 barrels of cement; 10 fire hydrants; 13 gate valves; 4 dozen corporation cocks; 2 dozen of machine cocks, and 4 dozen of nipples. Tenders are advertised for the above.

Montreal's famous 12,000,000 gallon Worthington pump, which was to revolutionize the city water supply, has broken down. It took about three years to build, and cost the city a great deal of money. The delivery pipe has burst. In addition to this, one of the valves which let water from the aqueduct into the pumping station proper has become wedged and cannot be opened.

NEWS OF THE TRADE IN CANADA

H. & W. Gamache, plumbers, Montreal, have dissolved.

Primeau, Landry & Co., plumbers, Montreal, have dissolved.

S. Dupaul & Co., plumbers, Farnham, Que., have been registered.

Amiot & Dufresne, electricians, Three Rivers, Que., have been registered.

Langton & Whelan, electrical contractors, Montreal, have been registered.

W. J. Walsh has obtained the contract for heating apparatus for the Hamilton Armory.

Ald. H. Mahoney, of firm of Mahoney Bros., plumbers, Guelph, has returned from a visit to Portland, Maine.

Elford & Cornish have the plumbing, heating and ventilating contracts for the Alexandra School at Saskatoon.

The 26th annual meeting of the American Public Health Association will be held at Winnipeg from August 25 to 28.

Secretary A. S. Lamond, of the Wolvenrine Brass Works, Chatham, Ont., and family, have returned from a week's trip to Buffalo.

E. G. Rust, of the Monterrey (Mexico) Plumbing Company, was a caller at the Toronto office of The Plumber and Steamfitter last week.

The Saskatoon School Board trustees awarded the plumbing contract for the King Edward School to Pugh & McCulough. The contract price is \$1,430.

Barr & Anderson, plumbers, Vancouver, have been awarded the contract of installing the heating for the new courthouse at that place. The figure is \$20,919.14.

Tenders for the electric wiring of Harrison Hall, municipal building, of Chatham, have been awarded to the Chatham Gas Company, the price being \$816.14.

B. Noble, London, visited Chatham, Ont., recently inspecting the plumbing and heating work so far completed by Westman Bros. at the Collegiate Institute there.

R. Miles, New Westminster, is receiving a good word for the up-to-date plumbing and sanitary arrangements which he recently installed at the market in that city.

Cuming & Senter, plumbers, Fredericton, have received contracts for installing the work in their line in the new houses of Byron Brewer, Percy Simpson and Mr. Edgett.

The contract for installing a steam heating plant in the new Young Women's Christian Association building at Sherbrooke, Que., has been awarded to J. C. Waterhouse.

Fewer Bros. have been awarded the contract for the plumbing and heating of the new Broadway School building,

Woodstock, N.B., the tender being in the vicinity of \$5,000.

Partridge & Anguish, the Fort Frances plumbers, have secured the contract for putting in the water and sewer connections into the new district jail now being built at that town.

Cummings, Sentner & Cummings are a firm recently established at Fredericton, N.B., which ought to make things go, each member of the firm having had a wide experience in the plumbing and heating trade.

Hahn Bros. & Co., of the New Hamburg (Ont.) Brass Works, have purchased the Berlin Aluminum Company's plant and business and intend to remove it to New Hamburg and merge it with their brass business.

Joe R. Devereux has accepted a position with the Empire Manufacturing Company, brass founders and finishers and manufacturers of plumbing and steam supplies, London, Ont., and will cover Eastern Canada for them.

Jas. Watt & Sons, Chatham, Ont., have received the contract for the installation of two up-to-date shower baths at the 24th Battalion Armory, there; also for a new smoke consumer for the shooting gallery and for plumbing for hot and cold water.

E. B. Welsby, plumber, Guelph, has made an assignment to his creditors. He has been in business for four years. The liabilities amount to about \$1,200. The principal creditors are the Gurney Foundry Co., and the James Robertson Co., Toronto.

Jas. Watt & Sons, Chatham, Ont., have completed the plumbing and gas fitting for the new convent in Wallaceburg. Cluff Bros., Toronto, have received the contract for the automatic plumbing devices and pressure system for the same institution.

Wm. Head, Victoria, B.C., president of the Head Plumbing & Heating Company, Calgary, took in the Toronto Exhibition this week in company with L. L. Anthes, of the Toronto Foundry Company. Mr. Head is on his way over to England on a pleasure trip.

Chas. Vezina, plumber, Quebec, was one of the guards to King Louis in the Tercentenary celebration and wore a suit of armor daily in the procession. Mrs. Vezina was one of the ladies in waiting to the queen. Plumber and Steamfitter has been disappointed in not getting a photo of the couple for our readers.

F. J. R. MacPherson, plumbing and electric contractor, Peterboro, will this winter build a motor boat and engine to run at the rate of 25 miles per hour or more. He states that it will be the fastest craft that ever sailed on local

waters. He owned the first gasoline launch in Peterboro County, and also the first automobile.

Blyth & Holloway, one of Ottawa's newest plumbing firms, have one of the finest display rooms in Ontario. Alterations are to be made to the windows this fall, the level being lowered and two sample bathrooms shown. Pictures of the windows and interior are promised. The Plumber and Steamfitter as soon as the changes are completed.

Tenderers for water pipe for the Halifax Board of Works were: Stairs, Son & Morrow, \$32.95 per ton; Canada Foundry & Iron Company, Londonderry, \$33.90 per ton; P. L. Piers, \$34 per ton; R. L. Wood, Philadelphia, \$38. The Board recommended to the City Council the acceptance of the lowest tender, which was Stairs, Son & Morrow.

J. R. McLennan, Ottawa, has two good school plumbing jobs on hand, the Collegiate Institute and the Elgin Street School, the former amounting to about \$9,800. McKinlay & Northeote and Currie & Livoek have the heating of the new school buildings. Currie & Livoek are also doing the plumbing and heating on the new Bank of Ottawa building.

Among the fine displays at the Saskatoon exhibition was the Western Heating & Plumbing display. The company had on hand a full line of plumbing and heating supplies, including a tub, low down closet, lavatories, sink, laundry tubs, cistern pumps, range boiler and a cabinet of nickel-plated bibbs and fittings. There was also a radiator. The rail in front of the display was made up of nipples, tees, valves and other pipe fittings.

Ottawa master plumbers are agitating for the drafting of uniform heating specifications, trouble being found in doing work as specified by the architects, who, speaking generally, are not familiar with the work of planning heating systems. An instance is told of one master fitter endeavoring to cover up an architect's error in specifying too much radiation for the size of boiler named. The fitter guaranteed the job with a smaller quantity of radiation than specified, and said he would instal a larger boiler if the house was not heated properly. The architect, however, was bull-headed and demanded that the full amount of radiation be installed. This has been done and when the system falls down next winter on account of the boiler being overworked, the architect will have to assume the complete responsibility.

Henry B. Davis, Chief Sanitary Inspector of the city of Washington, D.C., who is the chairman of the committee on tests appointed by President Edward Quinn of the American Society of Inspectors of Plumbing and Sanitary Engineers, is preparing to carry out the

work contemplated by this committee for more than a year. He is now desirous of receiving from manufacturers of nonsiphon traps two traps fitted up with water and air-tight glass or mica windows to be subjected to the tests, one for siphonage and the other for evaporation. The test will be conducted under conditions such as are met in actual service. If desired, the traps will be returned to the maker after the tests are completed. It is a foregone conclusion that these tests will be conducted in a perfectly fair and conscientious manner and will cover an extended period of time so that the report will be a valuable addition to the literature in the plumbing field.

GENERAL BRASS GOODS.

A new supply house that is making a popular line of goods is the General Brass Works, Toronto. Send for copies of their catalogues.

MONUMENT POTTERY.

Readers of The Plumber and Steamfitter should send a letter to the Monument Pottery Co., Trenton, N.J., asking for a copy of catalogue "C," a new 200-page book, which will make a valuable work to keep on file. A copy will be sent by express prepaid to any plumber writing on his firm's regular letter paper.

NEW PIPE CATALOGUE.

The Montreal Rolling Mills, Montreal, have issued a 1908 catalogue devoted to their wrought pipe for steam, water and gas, Lead pipe and soil pipe are also included and some interesting tables make the booklet worth sending for.

HONEYWELL SYSTEM ENDORSED.

The Honeywell Heating Specialty Co., Wabash, Ind., have issued two publications entitled, "Opinions of a Few of the Leading Jobbers" and "Reasons Why You Can Depend on the Honeywell System of Hot Water Heating." The former of these is a facsimile reproduction of some twenty endorsements of the Honeywell system of heating from leading jobbers. "One of our customers," says one jobber, "reports that he put in thirty of them last season and every one proved perfectly satisfactory. He is a man of large experience, and says that nothing has ever been introduced in the heating business that has proved as gratifying to the steamfitter or as satisfactory to the user." This is a typical endorsement, and all the other letters reproduced are as enthusiastic in their expressions concerning the system. The other publication is a little booklet which states in clear, plain and every-day language why the Honey-

well system is such a reliable device. If any reader of Plumber and Steamfitter does not yet have a thorough knowledge about the Honeywell system this little booklet will bring this information. It can be obtained on request by mentioning this paper.

TURNER BLOW TORCHES.

The Turner Brass Works, Sycamore, Ill., which last year built a large plant, including a factory building, 100x400 feet, with power house and heating plant, have since that time added to the equipment by the purchase of automatic machinery suited to their work. Prior to removal to Sycamore the company occupied a plant in Chicago. The product consists of a line of assorted blow torches, furnaces, brazers, kick and name plates, automobile supplies, dental apparatus, nebulizers, etc. To supply the demand for a portable gasoline brazer that will braze cast iron, the company is making what is styled the No. 48 Giant brazer, which is specially designed for such work. This machine is supplied with a large burner, producing the high degree of heat necessary for cast iron brazing. Alcohol blow pipes and torches are also included in the varied assortment of appliances constituting the company's line.

MODERN SANITATION.

The August issue of Modern Sanitation, which is published by the Standard Sanitary Manufacturing Company, of Pittsburg, Pa., well maintains the reputation of the journal for interesting news and well gotten up illustrations. Bertha H. Smith describes a visit to some Californian geysers under the title "A Day With the Devil." The writer describes the nature of the baths there, and the delights of bathing in vapor, and some charming illustrations accompany the sketch. J. J. Cosgrove continues his series of articles on "Designing Plumbing and Writing Specification," and on "Sewage Purification." One or two other sketches make up a number that is not only instructive, but entertaining to all plumbers. The Standard Sanitary Mfg. Co., in combining advertising with such a well-printed and illustrated magazine, are to be congratulated on their enterprise. T. C. Collins & Sons, Montreal, are the chief Canadian representatives of the company.

THE NEW NATIONAL SECRETARY.

H. W. Munday, Montreal, the new secretary of the National Association of Master Plumbers' and Steamfitters' of Canada, has had a varied business experience, having worked both for the Canadian and the United States Gov-

ernment, thus acquiring a knowledge of different plumbing methods and practices that is not only shown in the work he does, but fits him for his secretarial duties in which a wide acquaintance with the trade is so indispensable.

Mr. Munday learned his trade in Montreal, serving his time with Hughes & Stevenson, now J. W. Hughes. Afterwards he worked for A. T. State and J. E. H. Paton. He then went further away, and gained some valuable experience with Silver, Wilcof & Co., Springfield, Mass., and with A. F. Clark & Co., Bridgeport, Conn. It was during this time that Mr. Munday was engaged in some important work for the United States Government. Retracing his steps Mr. Munday worked for Butterworth & Co. and McKinley & Northwood, both of Ottawa. He then set up for himself in Montreal about eight years ago, and



HARRY MUNDAY, MONTREAL,

The New Secretary of the National Association of Master Plumbers of Canada.

has steadily gained ground ever since, his shop being a most busy one all the year round.

Mr. Munday throws a considerable amount of energy into all he does, whether it is work or play, and the thorough way in which he has identified himself with the interests of the National and Local Associations convinced the delegates this year that in selecting Harry Munday as secretary they were securing the right man. He has been chairman of the Apprenticeship Committee of the local association for about four years, and as chairman of the Entertainment Committee, managing two balls held by the Montreal Master Plumbers, he was mainly instrumental in making them the success that they were.

Harry Munday is not only a good business man, but a good athlete, and in his time has been a boxer, wrestler, run-

ner, and skater. In fact, among the sporting fraternity he is known as the "little man of iron." He is therefore in very good trim, both physically and mentally, for the onerous duties now devolving upon him.

In accepting office during the convention, Mr. Munday said that he was always prepared to sacrifice time to help on the Association, and those who know him are aware that he will be as good as his word.

PLUMBERS KEEP BACHELOR'S HALL.

If Ed. Higginbotham, Fort William, wants to show documentary proof to Mrs. H. that he knows how to keep bachelor's hall, all he need do is to pass on this week's Plumber and Steamfitter to his worthy spouse. Lawrie Anthes, of the Toronto Foundry Company, Toronto, happened to be on the job with his camera, and the two photos reproduced are the opening and closing views of a kaleidoscopic record of the day's doings.

The early morning scene shows the morning sun blazing in the window on the early risers, who had already churned a good supply of thirst-quenching "butter milk." Jack Marshall, of Marshall & Syme, Port Arthur, is Ed. Higginbotham's guest, and he appears to be ready to drink his host's health as soon as Ed.'s glass is filled.

The evening scene is even more domestic in its nature, Ed. being busy cooking supper for Alex. Cameron, another of Fort William's popular plumbers. The joke was on Ed. this time, as he kept posing for an unnecessarily long time waiting for Lawrie Anthes to press the button on his kodak. And the lid he was holding was by no means cold.

NO CEMENT, WAX, GREASE, PARAFFIN, PLASTER, TAR, PUTTY OR OTHER IMPROPER SUBSTANCE SHALL BE USED ON OR ABOUT ANY PIPE OR JOINT OF A PLUMBING SYSTEM, AND THE PRESENCE OF ANY FOREIGN SUBSTANCES SHALL BE A SUFFICIENT CAUSE FOR CONDEMNATING ANY SUCH JOINT OR PIPE OF A PLUMBING SYSTEM.

WHEN A NEW TRAP IS PROVIDED TO ANY FIXTURE, NEW OR OLD, IT SHALL BE VENTED AS REQUIRED IN SECTION 6, PAGE 56, BY-LAW 2262. THIS APPLIES TO NEW WATER CLOSETS SET IN PLACE OF OLD.

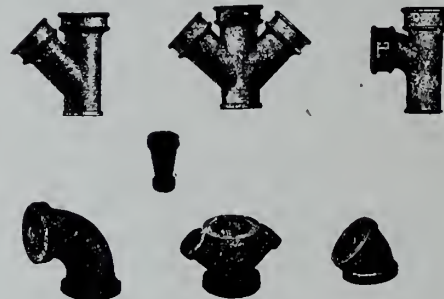
ALL PIPES IN A PLUMBING SYSTEM SHALL BE TESTED IN THE PRESENCE OF THE PLUMBING INSPECTOR BEFORE COVERING UP SAME.

ALL SOIL AND WASTE PIPES COMING THROUGH CEMENT OR OTHER FLOORS SHALL HAVE CLEAN OUT ON SAME, OVER FLOOR, WHEN SAME IS 5 FT. OR MORE FROM DRAIN.

ALL TRAPS MUST BE SET TRUE TO THEIR WATER SEALS.

ALL LOW-DOWNS, RICHELIEU AND OTHER CLOSETS MUST HAVE FLOOR FLANGE SOLDERED TO LEAD BEND OR LEAD PIPE WITH BOLTS UP THROUGH CLOSET.

FLOOR FLANGE

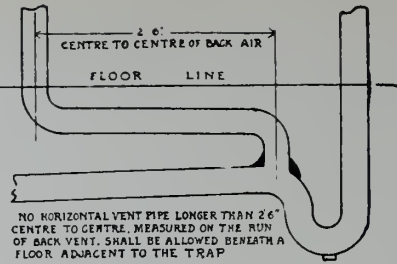


OTTAWA PLUMBING CHARTS—NO. 1.

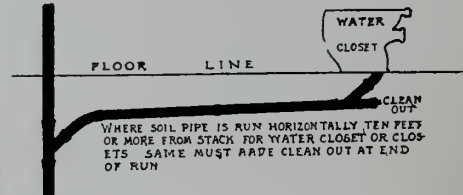
Fittings permissible on cast iron and wrought iron soil and waste pipes. Also $\frac{1}{4}$ and $\frac{1}{8}$ bends vent horns on Richelieu water closets must be closed up with lead cap set in putty and turned on rim of vent horn so cap cannot be pulled off. All pipes must be filled to the highest point in water testing.

Another bunch of pictures are promised soon.

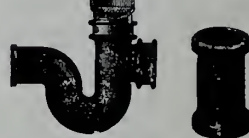
A simple test for the purity of water, which will serve in many instances to protect those who use water which is impregnated with sewage is to place a



NO HORIZONTAL VENT PIPE LONGER THAN 2' 6\"/>



WHERE HUBS OF SURFACE WATER TRAPS ARE SET LOWER THAN CEMENT OR OTHER FLOOR, THEY MUST BE EXTENDED TO TOP OF FINISHED FLOOR, WITH HUB ON PIPE AND STRAINERS IN END, AND CLEAN OUT OF TRAP PIPE AT LEVEL OF FLOOR AS SHOWN IN CUT.



COUPLING FOR USE ON WROUGHT IRON SOIL OR WASTE PIPE PLAIN COUPLINGS NOT ALLOWED.



Breakfast at 6 a.m.

Ed. Higginbotham, Fort William, Serving Freshly-Churned Buttermilk to Jack Marshall, Port Arthur.



Supper at 6 p.m.

Alex. Cameron, Fort William, Trying to Hold a Scalding-Hot Lid and Keep His Face Straight.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Aug. 31.—The markets have changed very little since our last issue. Orders show a stimulation, and the bulk is heavier, while inquiries seem to indicate a growing desire on the part of users to buy more liberally. It is evident that stocks generally are light, and with the prospects of fair contracts offering this fall many plumbers are commencing to buy further ahead than they have been doing for some time. Trade, while it could be better, is certainly on the mend, and with this, confidence is returning so far as replenishing stock is concerned.

The real estate market is reported to be in a more active condition, and inquiries regarding good profit-bearing investments are much more numerous than they were. Money is easier, and with the ever growing demands of Montreal and districts for business premises and residences, there is every encouragement to build. Up to now contracts for large business premises have been on the light side, and beyond the buildings in the business sections of the city now nearing completion, the bulk of the work has been supplied by residences which in some parts of the outlying districts of the city have certainly been built extensively.

Prices are about the same, and supplies are in a satisfactory condition.

IRON PIPE—Iron pipe has been stimulated lately, some larger orders being received. From now onward there should be a good demand as users' stocks are light. Prices are unchanged. Cast iron fittings and malleable fittings are likewise unchanged.

SOIL PIPE—Soil pipe has started to go out much more freely. Good trade is anticipated from now onwards. There is no change in prices, and we continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—The demand for lead pipe is improving, and fair quantities are going out. We continue to quote pipe and waste at 30, and traps and bends at 50.

SOLDER—There has been a stimulation in solder, probably owing to the large amount of roofing going on. Prices are unchanged, and we continue to quote 19c for half and half, and 18c for wiping.

ENAMELWARE—The demand continues to improve, the last month being an extremely busy one. A large number of houses are now wanting enamelware, and orders are consequently becoming heavier. Prices are unchanged on the best class of goods.

BRASS GOODS—With copper firmer

in the primary market, brass goods show a tendency to higher prices. Generally, however, there has been no advance. Special lines are showing a much better demand, and business is improving to a considerable extent.

RADIATORS AND BOILERS—Good, and what is better still, improving, business is being done in these lines. Inquiries are also promising, and the fall trade has the appearance of turning out very satisfactorily. We continue to quote radiators at 52½ and boilers at 50 and 10 off. Steamfittings are 60 off, with a good demand.

METALS—Tin continues to fluctuate in the primary market, but, locally, it has not changed. Copper is firm, and the other metals are about the same in quotations. The demand is an improving one generally, with buying on a heavier scale. We quote. Ingot copper, \$14.50; ingot tin, \$32.50; lead, \$3.70; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 2½c.

TORONTO.

Toronto, Aug. 31.—There is reason to feel confident that the plumbing trade will soon commence to improve. There is no denying that the business has been rather slow during the past few months, although one or two houses say they have had a fair share of work. Building in many centres is now as active as a year ago and something is bound to come of this.

Prices remain as at last quotation, although some shading is said to be done on iron pipe. Brass goods remain rather quiet, but by another month should be coming along nicely. Heating lines continue to go out freely, and these goods have really been the feature of the season.

IRON PIPE—Although some shading is said to be done all jobbers continue the quotations of a fortnight ago. For 1-in. galvanized \$6.76 is asked, and for 1-in. black \$5.11 is the price. Cast iron fittings are at from 62½ and 65, and malleable fittings run from 35 to 37½ off. Supplies are good.

SOIL PIPE—Only fair demand is made for this line with supplies about normal. Light pipe is 60 and fittings 70 per cent., while medium and extra heavy pipe and fittings remain at old quotations, 70 per cent.

LEAD PIPE—Pipe and waste at 30 and traps and bends at 50 per cent. continue to be the ruling quotations. Caulking lead runs from 4½c to 5c. Business is fair.

SOLDER—Demand is good for this line and supplies are adequate. Prices are unchanged from a fortnight ago.

Wiping is at 18c and half-and-half is at 19c.

BRASS GOODS—Normal demand with plenty of stocks and prices unchanged continue to rule brass goods. Fuller work and compression work are 70 and 65 per cent., respectively.

ENAMELWARE—No price change has come over this line. Some very fine samples of goods are to be seen in the various showrooms. Supplies are plentiful and demand is first-rate.

BOILERS AND RADIATORS—These goods continue to go out freely, both city and country seemingly wanting this line. Prices are unchanged from last quotations. This line has probably been the best seller among plumbing goods during the summer months.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in THE BOOKSELLER AND STATIONER, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, posters. The Hough Lithographing Co. Limited. Office, No. 3 Jarvis Street, Toronto Telephone, Main 1576. Art, good workmanship business methods.

THE BUSY MAN'S MAGAZINE is the most popular periodical of its kind. Why? Because each issue contains a strong list of original articles of interest to every Canadian. It also reproduces the most timely, instructive and interesting articles appearing in the other magazines and periodicals of the month. The cream of the world's periodical press is too valuable to overlook. BUSY MAN'S is on sale at all news-stands. Better still, send \$2 for one year's subscription. Mail it to-day. THE BUSY MAN'S MAGAZINE, Toronto.

IT PAYS FOR ITSELF.—The money you are now losing because you haven't a National Cash Register would pay for one in a short time. The National Cash Register Co., F. E. Mutton, Canadian Manager, 129 West King Street, Toronto, Ont.

ADDING TYPEWRITERS write, add or subtract in one operation. Elliott Fisher, Limited, 129 Bay Street, Toronto.

REPRESENTATIVE WANTED.

WANTED in every town and village, a representative to take charge of the circulation of our various publications:—Hardware and Metal, Canadian Grocer, Financial Post, Plumber and Steamfitter, Dry Goods Review, Printer and Publisher, Bookseller and Stationer, Canadian Machinery, and Busy Man's Magazine. Good financial standing and business connection a strong recommendation. Just the position for a retired business man for his spare time. The MacLean Publishing Company, Limited, Toronto.

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

Works at Valleyfield

If your nearest dealer does not handle our goods, write us.

EVERY PLUMBER AND STEAMFITTER

in Canada has some want which could be satisfied by a small condensed advertisement in our paper.

We reach twice each month almost every plumber and steamfitter from one end of Canada to the other. It seems reasonable to suppose that some one of our readers will want to buy just what you have to sell, or will want to sell just what you have to buy.

The rate is low. 2c. per word for the first insertion, 1c. per word for subsequent insertions. Send cash with advertisement to our nearest office.

PLUMBER AND STEAMFITTER

MONTREAL

TORONTO

WINNIPEG



THIS IS THE DAY OF

INVESTIGATION

Get in line and let us prove to you that the

GENUINE

Armstrong Stocks and Dies

ARE THE BEST.

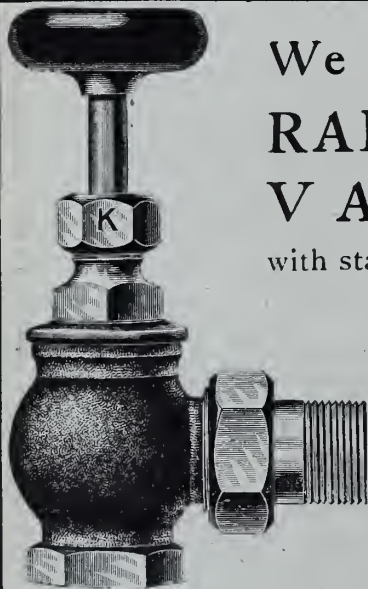
Catalogue on request.



The Armstrong Mfg. Co.

317 Knowlton St.

Bridgeport, - Conn.



Sizes $\frac{3}{4}$ " to 2".

We make these RADIATOR VALVES

with standard brass disc, and with the Jenkins Disc, with and without Unions.

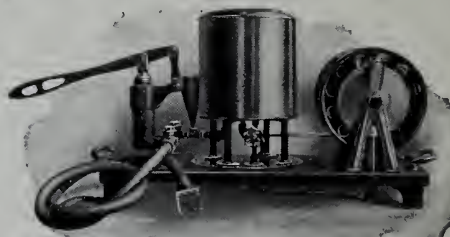
They are made from good metal, tastefully machined, and are handsomely plated and polished. Mounted

with best quality Wood Wheels. The Valves are right and the prices are right. All the large dealers sell KERR Valves. Ask for them. Our name is on every valve, and it guarantees the quality.

THE KERR ENGINE CO., LIMITED
WALKERVILLE, ONTARIO

PLUMBERS YOU WANT THIS!

If you have frozen pipes underground ANYONE CAN USE IT. WILL PAY FOR ITSELF IN



A SHORT TIME.

ASK FOR BOOKLET

MACHINES ON TRIAL

WHY NOT WRITE US

THE BURBANK THAWING MACHINE CO.
BERLIN, NEW HAMPSHIRE, U.S.A.

INFORMATION

about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect all the items of information appearing in Canadian newspapers about any subject you are interested in. Our service is thorough. We don't miss an item. If you want all the current information about a pet subject, we can supply it at the lowest cost. By using our service you can keep posted on any subject.

WRITE FOR OUR FREE BOOKLET.

**THE CANADIAN PRESS
CLIPPING BUREAU**

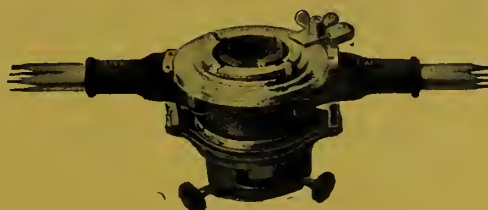
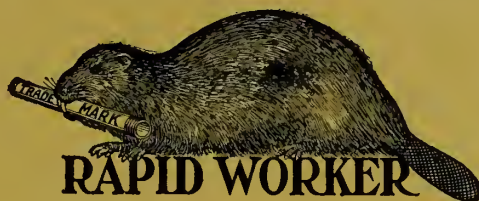
232 McGill St., Montreal.

10 Front St. E., Toronto.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto

PERFECT WATER CIRCULATION

is absolutely necessary to a good hot water heating system. In this respect, the

"Sovereign" Boiler

has no equal. In the Sovereign the water does not settle long enough to boil. It circulates around the interior sides of the fire pot, into the right hand side of the water post; thence into each of the five separate boiler sections through corresponding holes in the water post; in, around, and out of the sections into the left hand side of the water post; thence out through the top of the post into the radiator system.

STEAMFITTERS! Send for Catalogue To-day.

TAYLOR-FORBES CO., Limited

TORONTO—1088 King Street West

ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St.

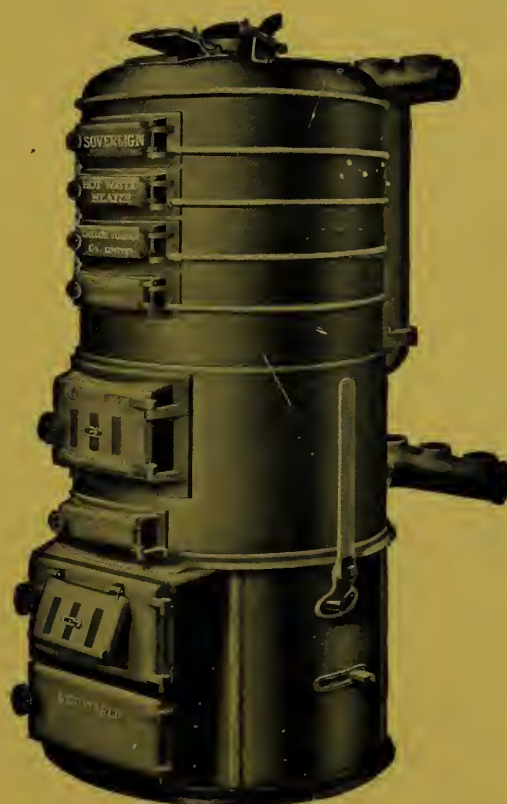
MONTREAL—122 Craig Street West

QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited

VANCOUVER, B.C.—Taylor-Forbes Company, Limited

CALGARY—The Barnes Company, Limited



THE STANDARD Ideal CO.

LIMITED

¶ This is one of the many new designs in Lavatories, that we have now ready for the market.

¶ We are also making a number of Baths, Laundry Trays and Roll Rim Sinks, which are entirely new.

¶ Particulars of these can be obtained on application to our Head or Branch Offices.

Head Office and Factories, Port Hope, Ontario

Branch Offices and Sample Rooms:

Toronto, 50 Colborne Street; Montreal, 128 West Craig St.; Winnipeg, 154 Lombard St.

The Labatt Manufacturing Co., Limited

MANUFACTURERS AND JOBBERS OF

Plumbers', Steamfitters' and Engineers' Supplies

High - Grade Plumbing Specialties,
Tools, etc.

367 Queen Street West
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and

Bathurst Street
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PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL 232 McGill St.

TORONTO, 10 Front St. E.

WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 18. (New Series). Publication Office : 10 Front St. East, TORONTO, SEPT. 15, 1908. Old Series, Vol. XX. No. 18

1908

DAISY

CIRCULATION

PERFECT CIRCULATION is as important in a Hot Water Boiler as in a human being.

POOR CIRCULATION is as common in Hot Water Boilers as in members of the human family.

GOOD CIRCULATION is absolutely necessary in the human to radiate good health, and in a Hot Water Boiler to radiate good heat, and lots of it.

THE DAISY.—Water circulation, is its strong point, balanced to a nicety—absolutely perfect—unapproachable.

RESULTS.—MAXIMUM HEAT, COMFORT AND EFFICIENCY
MINIMUM COAL CONSUMPTION, WORRY AND EXPENSE.

PROOF.—Over **30,000** satisfied users attest this fact.

WARDEN KING, Limited, Montreal

CLUFF BROS., Selling Agents, Toronto, Ont.

IN SELECTING A Steam Boiler

look your illustrated Printed Matter over to see

First : Is the water-line in the top push nipple, or four or five inches below it, as in the Gurney 900 Series Boiler.

Second : Are the firepot walls sloping and irregular, or straight and self-cleaning, as in the Gurney 900 Series Boiler.

Third : Is there only a thin sheet of water in the walls of the firebox or a generous bulk insuring a steady water-line as in the Gurney 900 Series Boiler.

Fourth : Do the sections butt close together, or are fitting-strips provided to prevent rust cracks, as in the Gurney 900 Series Boiler.

Fifth : Is it a foreign construction, or Canadian-made, like the Gurney 900 Series Boiler.



Note this extra water-arm directly over fire.



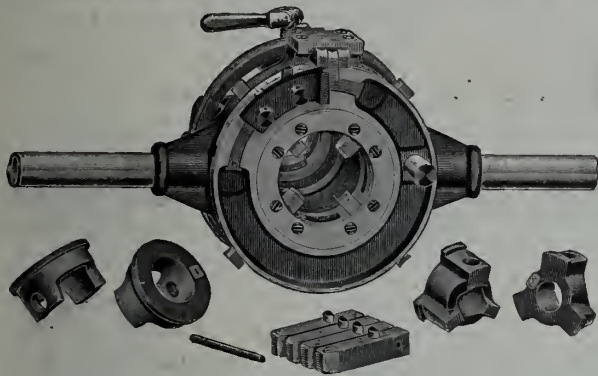
The Gurney Foundry Co., Ltd.

Toronto, Hamilton, London, Montreal, Winnipeg, Calgary, Edmonton, Vancouver.

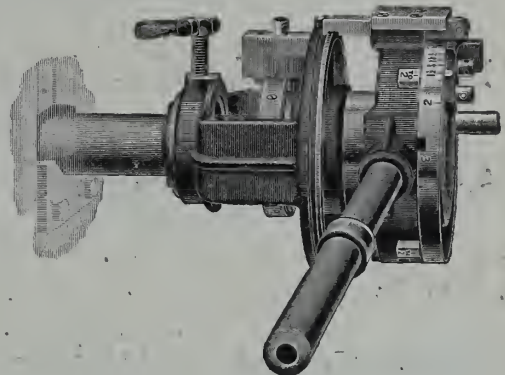
POWER REDUCED

to a minimum

This refers to the exertion necessary to thread pipe with a "Buckeye" Die Stock; it is much less than is ordinarily required. Other points in the use of this tool are—

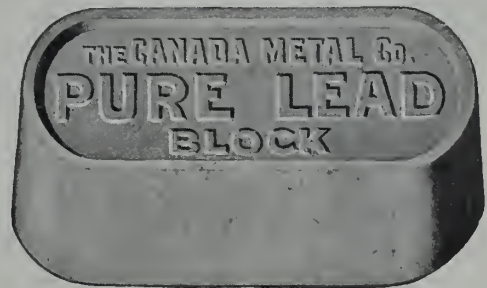


The dies themselves stop the cutting when the thread is long enough, and there is no turning-back to be done then. No pressing is necessary to start the dies. The automatic leading device does that.



The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

Except You Have Used



our pure **Lead** in five pound blocks, you do not know the pleasure of caulking a joint. Used from Coast to Coast. Try it at your Supply House, if not in stock write us.

The Canada Metal Co., Ltd.

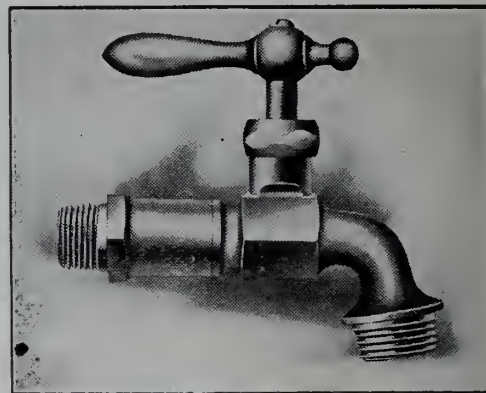
TORONTO

ONTARIO



See See See

If you want to give good satisfaction
and be happy



USE

"Monarch" Cocks and Valves

it's a habit well worth acquiring.

Monarch Brass Manufacturing Co., Ltd.

Office and Warehouse
278 Dundas St., Toronto

Factory
Port Colborne, Ont.

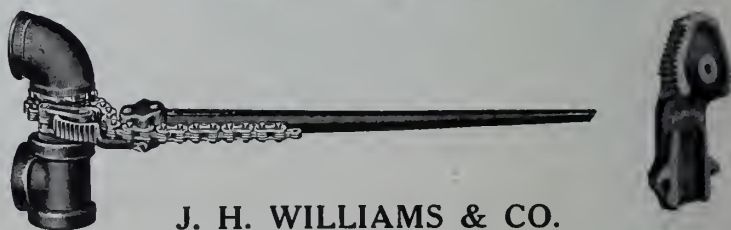


DISCARDED FEATURES

threaten you. See the chain? It will of its own weight fall from its locking pockets when working overhead. It threatens you with grave dangers when working in elevated positions. Discarded by us years ago, it is now being advertised as permitting a shift from one to other side of pipe without removing chain. It will permit the shift but it brings dire dangers with it because it

is not safe in all positions. We are pioneers in, and all our lives have studied, chain pipe tools. The "Agrippa" Single Jaw is without mechanical or construction fault—the only absolutely safe tool of equal capacity for crooked fittings or pipe. There's no other. Guaranteed and on trial from your dealer.

"AGRIPPA"



J. H. WILLIAMS & CO.

Pioneers in Chain Pipe Tools
BROOKLYN, NEW YORK

OUR "WANT ADS." get clerks for employers and
find employers for clerks.

The Honeywell System of Hot-Water Heating

9,000 Systems in Use in America.



We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

While our Canadian representatives will give their attention to making the trade on this side acquainted with the merits of the Honeywell System of Hot Water Heating and render engineering advice to the interest of the fitters, we will not fill orders direct for our specialties, but will supply the trade entirely through the established Canadian dealers.

The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



The Honeywell Heating Specialty Co.,

Plant and General Office, Wabash, Indiana

M. D. Tillman, Box 1113, Montreal, Canadian Representative.

BOOKS FOR PLUMBERS AND STEAMFITTERS

Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

American Steam & Hot Water Heating Practice	\$3 00	Hot Water Heating, Steam & Gas Fitting, Acetylene Gas—How Generated and How Used. By J. J. Lawlor and Geo. T. Hanchett	2 00	Principles of Heating. By W. G. Snow	2 00
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MacLean Publishing Co. 10 Front St. E., Toronto

BUILDING A DEMAND

A TALK TO PRODUCERS



is primarily a *quality* circulation. Every reader is in the "*good buyer*" class. There is positively no other publication which so *thoroughly* covers the Canadian field from one ocean to the other. If you are a manufacturer it will pay you to investigate.

RATES VERY MODERATE. RATE CARD AND SAMPLE COPY PROMPTLY MAILED ON REQUEST

THE BUSY MAN'S MAGAZINE
10 FRONT STREET EAST TORONTO

IT is a well-established fact that if you can get the *best* class of people to use your goods, the *mass* of the people will speedily follow suit. Consequently it is a very wise policy for manufacturers to *help retail dealers* by advertising their products to the best class of consumers. The most reliable advertising medium by which a manufacturer may talk to the *leading people* of every community in Canada is THE BUSY MAN'S MAGAZINE. Its circulation

The **James Robertson Co.**
Limited

**Architects, Plumbers,
Builders and
all persons interested**

*are invited
to inspect*

Our New Show Rooms

**all that is latest and
best in high-class sanitation**

Call at any time

The James Robertson Co., Limited

**265 King Street West
Toronto, Ont.**

Plumber and Steamfitter

and Sanitary Engineer of Canada

Published on the 1st. and 15th. of
each month by
**THE MACLEAN PUBLISHING
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Subscription - - \$1.00 per year
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Circulating amongst Plumbers,
Steam, Hot Water and Gas Fit-
ters, Sanitary Inspectors, Heating and
Ventilating Engineers, City Engineers,
Boards of Health, Architects, etc.

MONTREAL, TORONTO AND WINNIPEG, SEPT. 15, 1908

GOOD WORK IN NOVA SCOTIA.

The attention of the trade is drawn to the draft act of incorporation of the Nova Scotia Master Plumbers' Association as reproduced on another page in this issue. With Nova Scotia perfecting its organization other provinces should be inspired to similar action. It's up to the provincial vice-presidents to start the ball rolling. Let there be a spirit of friendly rivalry to see which province will have the best report to make at the next national convention.

SEPTIC TANK TREATMENT OF SEWAGE.

The Toronto Globe, in discussing the selection of a site for the proposed septic tank sewage disposal plant takes a practical view of the matter. Urgency is required and nothing can be gained by allowing interested property owners to delay a needed public work, as will be seen by a walk through the older sections of Toronto where the poor are herded in close proximity to foul smelling outhouses. The Globe says:

"There seems to be no room left for reasonable doubt as to the efficiency of the treatment of sewage in septic tanks, or of the adaptability of such a system to Toronto. There is virtual unanimity among the scientific observers and experimenters that the noxiousness of crude sewage may be largely eliminated by purely biological processes at a minimum of expense, and with little to object to in the way of exhalations. The process is a natural one, but artificial accommodation must be provided for the sewage during the period of decomposition, and this is done by passing it through concrete tanks in which it is allowed to remain until in due time it becomes comparatively harmless.

"The ratepayers of Toronto a few months ago approved of the establishment of a system of sanitation of which the trunk sewer and septic tanks are to be essential parts. These are inseparably connected. It would be worse than useless to collect the sewage unless it is to be septicly treated before it is allowed to escape into the open lake. Better far let it remain to be decomposed in the bay than collect it by means of a trunk sewer, to let it pass out at once beyond the protecting sand-bar to pollute the source of our water supply.

"The location of the septic tanks must be determined by the conformation of the land along the city front. There are two great depressions, the valley of the Don and the valley of the Humber, and between them there

is a plateau of considerable elevation. It seems obvious enough that eventually there will have to be two sets of septic tanks, one in each of these valleys, and that the first and most necessary one should be near the Don. To this some residents of the east end object, but there is no way of meeting their views to the extent of exempting them from what they deem a nuisance. Sewage, like water, flows down hill, and nature has determined the point to which it must be conducted for treatment. Fortunately the offensiveness may be greatly minimized. The tanks may be permanently closed in by concrete, and the whole spot may be converted into a lawn or a flower garden by covering it to a sufficient depth with earth.

If it is inevitable that the septic tanks must be constructed at the low level of the land near Ashbridge's Bay, then the ratepayers of the east end should, in the general interest, aid in having them put in and covered up as soon as practicable. Opposing the selection of sites, one after another, can only delay a conclusion that may not be permanently avoided. It would be better to substitute co-operation for obstruction and let the work proceed as rapidly as possible. At shortest it will take a long time to complete."

STOLE BATH FROM EMPTY HOUSE

Things must be pretty rotten in a city where thieves go into empty houses and strip them of all the lighting and plumbing fixtures. This happened in Toronto a week ago, the intruders removing the gas chandeliers, the bath and all the lead pipe not covered up by protecting walls.

In the first place, the police force must be inefficient for thieves to be so nifty. A wagon must have driven up and secured the booty and this would not have been done if the dark lantern gentlemen hadn't known about what to expect from Toronto's police force. And Noel Marshall, from whom the stuff was stolen, places about the same estimate on the police when he offers \$100 reward for the conviction of the robbers.

But there's another way to look at the incident: Who would swipe plumbing fixtures and lead pipe but a plumber? And where will you find a plumber low enough to become a housebreaker except in a city where conditions are such that a man finds it hard to earn an honest living?

Yes, things in Toronto are pretty rotten. With about one registered master plumber for every 1,000 inhabitants,

with it possible for anyone with a dollar (and no experience) to secure a license, with master plumbers accepting contracts at less than cost of materials and labor in the hope of making a profit by scamping the work or substituting cheap grade fixtures, and with trade generally being done on such an unprofitable basis that established firms going out of business cannot sell their goodwill for a meal ticket at a cheap restaurant, things have about reached a point where some of the incompetent price-cutters find themselves unable to buy supplies for cash at the supply houses and start in to buck the police.

Is it any wonder that the Toronto master plumbers who are at all intelligent, are endeavoring to reorganize the trade with the aim in view of having educational discussions and overcoming the influences which are bringing discredit and financial loss upon the trade?

MASTERS AND JOURNEYMEN JOIN HANDS.

The master and journeymen plumbers of San Jose, Cal., have joined hands in a movement toward the betterment of conditions existing in that city regarding sanitary matters. According to the reports received by these two bodies, there has been considerable plumbing work done during the past few months that has not been properly done or inspected, as is required by the city ordinance governing such work. They claim that the work is, in a measure, a menace to health and state that they are not actuated by any selfish motive, but are simply acting in behalf of the general welfare of the community. Under the city ordinance all plumbing work has to be inspected twice before a certificate is issued. The first inspection is made when the work has been roughed in and the second when the work is completed. If the work is not done according to the specifications and rules of the city the plumbing inspector has the right to order it done over again.

NEW YORK'S VENTILATION LAW.

A new ventilation law which may mean much or little, according to the way it is interpreted by the man responsible for its enforcement, has been placed lately on the statute books of New York State. It relates to the ventilation of factory buildings and is intended, apparently, to compel the installation of mechanical ventilation apparatus in buildings or lofts where large numbers of workers are housed together in closed spaces. Like the New Jersey ventilation law, this act is hidden away in the "Laws Relating to Labor and Factories." It became effective in October, 1907.

The law, according to the Heating & Ventilating Magazine, states that "the owner, agent or lessee of a factory shall provide, in each workroom thereof, proper and sufficient means of ventilation and shall maintain proper and sufficient ventilation; if excessive heat be created or if steam, gases, vapors, dust or other impurities that may be injurious to health be generated in the course of the manufacturing process carried on therein, the room must be ventilated in such a manner as to render them harmless, as far as practicable. In case of failure, the commissioner of labor shall order such ventilation to be provided." Failure to comply with the law within 20 days is punishable by a fine of \$10 for each day thereafter.

Under the present chief inspector of factories, the law is being interpreted strictly and, as a result, the owners and landlords of such buildings are complaining bitterly of the trouble and expense imposed upon them

in living up to its requirements. A number of such owners who are members of the Realty League of New York, are making it their special object to bring about the repeal of the law.

The only organized efforts made so far to offset the work of these members of the Realty League have been undertaken by The American Society of Heating and Ventilating Engineers. That body took prompt action when its attention was called to the matter at the recent meeting in Niagara Falls, by assigning to several of its New York State members the special duty of furthering the sentiment for the law as it stands, as well as backing up the efforts of the Factory Inspection Bureau in securing its rigid enforcement.

MUNICIPAL PLUMBING LAWS.

In a recent address before the Connecticut Association of Master Plumbers, Bernard Lyon gave some advice which is as applicable to Canadian master plumbers as to their brothers over the border. He urged plumbers to unite to have one member appointed a member of the local Board of Health or such department where plumbers receive, or should receive, their licenses. As a general rule, doctors are the only representatives on these boards, but plumbers prevent where doctors cure diseases. The reasons for having plumbers represented on the Board of Health are summed up by Mr. Lyon in the following suggestions:

"Have proper rules made and have an inspector appointed who is a practical plumber, and have him see to it that all plumbers live up to these rules or prosecute them if they do not.

"Have licenses renewed annually, a small fee to be charged for these. If the master plumber does his work in an irregular or unsanitary way, hold up his license or cancel it altogether. Such men should not run a plumbing establishment.

"Have your inspector work in hand with the master plumbers. Invite him to your social gatherings, have blackboard talks and a public question box, and if you can bring forward some new idea to benefit the trade as well as the public, you yourselves will also be benefited by it.

"Change your rules every other year so you can improve and progress with the times.

"Send in your application for all plumbing work, and have it so arranged that when rough work is tested tight, have an order made out and signed by your inspector, and when the job is finished complete, have him give you a certificate, so you can give it to the owner or builder to show that you have done honest work, and thereby he should pay you what is your due. It will also make just competition, and every plumber must do the same kind of work.

"To do this you must have a master plumber on your representative Board of Health, who will work for your moral as well as your financial interests, and when you have trouble with your inspectors he can act as an arbitrator, being just to all concerned.

"How many times have you all estimated on work intending to make same an honest and sanitary job complete, to be done in a workmanlike manner for a good customer of yours, and right before your own eyes one of those fly-by-night plumbers walks in and does the job for one-half of your price, and you all know what kind of a job he has done, and thereby you have lost a good customer who does not know what is sanitary or unsanitary, but sees the new fixtures and the nickel work, and thinks he has saved money and calls you a robber?"

Displays at Toronto Exhibition

Some Fine Exhibits of Gas Stoves, Heaters, Lighting Fixtures, Enamelware, Plumbing Supplies, Lead Pipe and Metals of Interest to Plumbers.

"BEAVER BRAND" ENAMELWARE

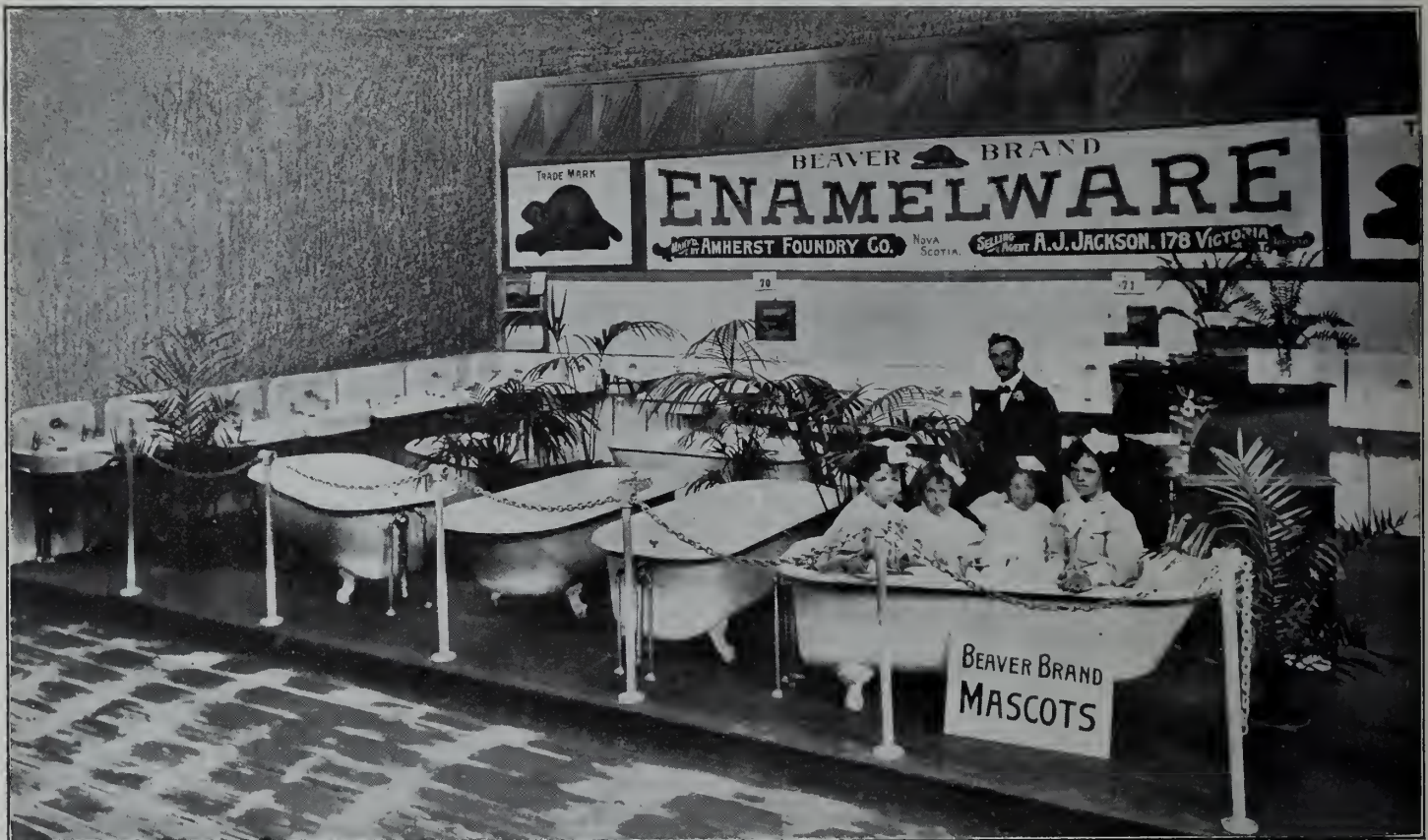
An exhibit of useful goods which might be put in the artistic class, was the display in the Process Building made by A. J. Jackson, representing the "Beaver Brand" of cast iron enameledware, manufactured by the Amherst Foundry Company, Amherst, N.S. The display includes baths, sinks, drain boards, laundry tubs, lavatories, closets, etc., and these articles were so arranged that a person might examine every one of them. Interspersed are a number of palms, which add an air of attractiveness to the exhibit, and, above all, is the

1½ inches. This bath has proven to be a great seller to replace the old style boxed-in zinc baths. Other white porcelain enameled baths are displayed, showing larger roll rims running up to 3 inches.

Another particularly striking sample of enamelware is the two-part enameled laundry tub. This tub has caused more inquiries than perhaps all the other articles in the exhibit. It is a cast iron white enameled laundry tub in two sections. The back is in one piece and separate. A wringer attachment will

and corners, and with all styles and sizes of rims. Some have both aprons and high backs. There are also some enameled sectional lavatories for use in hotels and public places, all of them neat and some of them quite elaborate.

Of the business conducted by Mr. Jackson it is safe to say there has been an increase of one hundred per cent. during the past year, and the business is still growing. Mr. Jackson has control of the selling territory in Toronto and throughout Ontario, and is more than pleased with the business being done, some very satisfactory orders having re-



Toronto Industrial Exhibition—A. J. Jackson's display of Beaver Brand Enamelware.

"Beaver" trade-mark. The accompanying photogravure gives a clearer idea of the arrangement than could possibly be written.

For "Beaver Brand" enameledware it is claimed that it is excelled by none, and is the best ware made for color, durability and attractiveness, the beaver trade-mark being the highest guarantee for quality. Some of the goods have features of special importance, notably a narrow rim bath tub, with a roll of only

prove popular with buyers. This tub is made also in three sections.

A new pattern roll rim sink is an interesting feature of the exhibit. A great many of these have been sold during the past year, and not one has been returned for any cause, nor has a single complaint been received regarding them. There is a good display of flat-rim sinks in all the standard sizes.

Lavatories and basins of all kinds are shown in profusion, both for side walls

cently been filled, one of them being quite an advertisement for his goods, when twelve wagon loads of enamelware paraded the main streets of Toronto on their way to the railway freight sheds.

A catalogue descriptive of enameledware handled by Mr. Jackson was distributed at the exhibit, and may be had from his office 178-180 Victoria Street, Toronto. All the goods sent out by him for shipment in less than carlots are carefully boxed and crated.

GURNEY'S FINE EXHIBIT.

There is always something doing in the northwest corner of the stove-building, where the Gurney Foundry Co., Toronto, have, since the erection of the building, had their exhibit. Stalls for the better displaying of several of their lines were erected and with the colored electric lights and floral decorations, the general display was very attractive.

Gurney's masterpiece, the Oxford O. K., steel range received so many favorable comments that the sales for it are assured. Built of cold rolled steel, dead blue color, and a polished gun metal top that requires no blacking, this range is the most handsome hue known to the stove trade. A double partitioned oven-door and heavily lined asbestos body makes the oven a wonder in quickness.

The Oxford Chancellor is too well known to the stove trade to require any comment and the best testimony of its effectiveness is the large sale the firm have had for it. A new steel range line, the Canadian Oxford, built of blued steel with the divided flue, and Gurney's reversible grate that burns the coal to a white ash, is a lower priced range than the Chancellor and is sure to win many friends for it.

A natty, useful, well-built stove gotten out by this firm is called the Golden Nugget. It is a steel cook that will work just as well as a high-priced range, and has the new grate that draws out through the front door. No shipping breaks are possible, as this stove is all of pressed steel. They come in two sizes of ovens with or without reservoir, and as the price is right, it is just what the trade have been looking for.

Gurney's new Imperial Oxford, 100 series, has made so many friends for itself since it has been in the market that there are very few indeed who do not know of its value, and judging from the comments of visitors in passing the display the popularity of this line is not yet at its highest. The nicety to which it is proportioned catches the eye, but

the results from the oven are still more lasting.

The Oxford Art Laurel is certainly a work of art. It is making its initial appearance to the trade, and certainly merits attention. A handsome, finely-nickelled base-burner, it has a flue construction that cannot be surpassed for

Gas ranges, both artificial and natural, were on exhibition, and the familiar lines of the Oxford Economy, and Oxford "B" series drew forth many an exclamation of praise from housewives, who had one like them in their kitchens.

Gurney's John Bull Hotel range is familiar to everyone who has need of a



Toronto Industrial Exhibition—Gurney Foundry Co.'s Special Display Booths.

power in getting heat where it is most effective.

The Oak lines were not forgotten, and especially one, the Oxford Mojogram, is worthy of mention. It is a highly finished product in which the value of seeing the fire has been provided for by large mica doors. It is right up to the minute, having a duplex grate, powerful double heater, smoke-burning ring, and feeder, if desired. This Oak can be recommended as an extra powerful heater, and pleasing to the eye. Nearly every possible kind of a heater was shown here and great interest was taken in them by the trade.

heavy duty range. There is no line of hotel goods made that give as large an assortment of styles and sizes. Urns for all purposes, steam tables, bake ovens, clothes dryers, and cooking utensils formed an attractive array for the hotel or restaurant man.

"Made in 1845," an old-style heater, was viewed with interest by all, and many a pleasant smile spread over features, wrinkled with age, as they saw once more the familiar style of their younger days. Dating so far back as 1845, the Gurney Company have certainly earned the title of "stove builders."



Toronto Industrial Exhibition—Gurney Foundry Co.'s Stove Exhibit.

MORRISON'S BRASS GOODS.

Probably the best display in Machinery Hall, and certainly one of the finest exhibits at the Toronto Exhibition, was that made by the James Morrison Brass

ing the decorations were also part of the exhibit. The display was divided into four sections—lighting goods, plumbing goods, brass goods and engineers' supplies.

electric light, from the simplest to the most ornate designs. One dull brass grand piano lamp for electric light stood on a pedestal six feet high, which itself was lighted by tiny lamps, the shade and openings being filled with dark green glass, casting a soft color around. Then there was a table fountain and fern pot, which was lighted, the lamps being almost invisible. A Sherring stand folding lamp is distinctly new, and a hanging lamp of old-fashioned design, with candle sconces was a novel feature.

In plumbing lines, besides the usual enamelware goods, were some distinct novelties. The folding urinal is one of these. Made of aluminum it may be attached to office walls, and will prove a great convenience. The "Natura" low-down closet combinations attracted much attention; and the "Astoria" outfits, which possess strong flushing properties, were centres of interest. The woodwork on these outfits is mahogany. The Nethery flush valve is a splendid product, and so is the Humphrey Instantaneous Bath Water Heater, an invention lately put on the market.

A splendid piece of work in the shape of a lectern draws attention to the brass goods by this company. The chains and fancy railings closing in the exhibit are also the products of the concern, and these speak for themselves. In fact all the brass work shown in connection with the lamps and engineers' supplies, was made by the company. The designs were of infinite variety, some of them showing very delicate tracings.



Toronto Industrial Exhibition—Morrison's Brass Goods Exhibit.

Mfg. Co. Not only were the goods displayed made by the company, but the railing, chains and fixtures used in help-

Among the lighting goods, all of which made a brilliant show, were many table, hanging and wall lamps for oil, gas and



Toronto Industrial Exhibition—James Morrison Co.'s Plumbing Exhibit.

ROBERTSON'S MARBLE BATHROOM

Entering the central doorways of the Process Building, the first thing to arrest the attention of passers-by was the elegant display of plumbers' supplies made by the James Robertson Company, Toronto, in the beautiful permanent booth they erected a couple of years ago.

Set off by glistening plate and bevelled mirrors on the walls, and palms and ferns on stands between the bright enamelled fixtures, the display was as attractive as any on the grounds and interested visitors were constantly inspecting the exhibit and building plans in their minds for more elaborate bathrooms and kitchen sinks in new houses to be erected.

Three large marble lavatories, the work of the Robertson marble yard in Toronto, were in the forefront and excited much surprise amongst visitors who were not aware of the wide scope of work undertaken by the company. The quality of the work, too, attracted the attention of many architects and plumbers from out of town, while many well-to-do people stopped to inspect the lavatories.

The bath probably attracted as much attention as any other lines, a "Gladstone" and a "Yale" being fitted up for display. Beside them was an up-to-the-minute sitz bath, with bell-supply, liver spray and bidet supply, the latter feature attracting much attention. This fixture, so prominently shown, was calculated to cause much inquiry, and readers who failed to visit the Fair should ask the Robertson travelers for information or write to headquarters for catalogues or circulars.

Half a dozen pedestal basins and three samples of Naturo Aeme, or Fleur-de-lis closets rounded off the general display of

bathroom fixtures. There was also, however, a large Standard Ideal one-piece sink, with a sunken drain board, the latest thing in its line, and it was greatly

bath, with bell supply, completed the fixtures. A wall cabinet and a complete set of the latest in towel racks, glass and brush holders, etc., completed what every



Toronto Industrial Exhibition—Jas. Robertson Co.'s Marble Bathroom.

admired by every housewife who saw the display.

Adjoining the general exhibit was the model bathroom, with marble floor and walls, and fitted up with a solid base "Premier" bath, with shower and mixing attachment. A Naturo closet connected with a flushometer, a beautiful pedestal porcelain lavatory, and a foot-

visitor agreed to be the best model of a modern bathroom yet shown at the Exhibition.

Taking up little space, and yet too important to be overlooked, were samples of the lead products of the company including lead pipe, traps, waste, solder, etc., all high-grade lines, backed by the guarantee of this old-time supply house.



Toronto Industrial Exhibition—James Robertson Co.'s Plumbing Exhibit.

CANADA METAL COMPANY.

Right at the main entrance to Machinery Hall was the very striking exhibit of the Canada Metal Company, William Street, Toronto. The display comprised all manner of ingot and manufactured metals, the mere mention of which would take in everything in the metal class. There were babbit metal, solder, lead pipe, black tin pipe, lead traps and bends, fuse wire, battery zincs, ingot copper, lead, tin, spelter, antimony, aluminum and all other metal lines handled by hardwaremen and plumbers. These metals were attractively grouped in squares, pyramids, and other shapes, the work being done by Mike Matthews.

else in the metal line a plumber or anybody else wants and the Canada Metal Company is unable to supply, Mr. Harris would like to know what it is, and he will see that it is obtained.

Lead washers and various grades of solder for tinsmiths are carried in stock, and builders may obtain lead sash weights from the same company. For glaziers there is wire solder, cam lead; metal bar in zinc, brass, copper and silver, as well as ornaments for corners. For the brass foundry the company handles phosphor, tin and bronze, zinc spelter, pig lead, antimony and ingot copper and tin. For rolling purposes there is Britannia metal, coffin plate

at a moderate price, and the metal itself may be relied on. Like all the products of this concern this metal is guaranteed. Then there is the Imperial Genuine, for heavy and high duty engine work. There is no work too hard for it to do. The special grades of metal for newspaper work speak for themselves, when it is known that practically every paper in Ontario west of Toronto, using typesetting machines of any kind, take the Canada Metal Company's product. One of these special grades is the Combination Newspaper Metal, which may be used either in linotype machine and stereotype pot. It shows results in a perfect plate and slug. The metal for



Toronto Industrial Exhibition—Canada Metal Co.'s Exhibit.

the Western representative of the company, who, with General Manager W. G. Harris, had charge of the exhibit.

A glance at the accompanying illustration will show how such ordinary things as metals can be prettily set out. One of the special lines manufactured for plumbers' use and shown in the exhibit is the non-syphon centrifugal cast trap. This article was the centre of much interest. It has a perfect seal, will not syphon and washes out perfectly. Other plumbers' lines carried by the company are lead pipe, lead waste, hydraulic drawn traps, strictly bar, star extra wiping and acme wiping solder, brass ferrules, tinned, iron and lead combination ferrule bends or spun end test, and sheet lead. If there is anything

metal, pure sheet block tin, and sheet lead in special sizes.

Besides these lines the Canada Metal Company manufactures metal for machinists, canners, electricians, newspapers, printers, fishermen, etc., and, in addition to doing galvanizing and tinning, makes brass, bronze, copper, aluminum and lead castings from patterns. There are other lines of work done by the company not enumerated here, and it is no exaggeration for the members of the company to say that the Canada Metal Company may well lay claim to being "the largest exclusive metal men in Canada."

As to babbit metal, there is the Harris heavy pressure bearing metal, which is a very popular hardware babbit, and is best for all machine bearings. It sells

linotypes alone is known from coast to coast, and nearly every big newspaper in Canada uses it.

The company is content to rest its claims upon the results achieved by its products, and if repeat orders are any criterion, then the Canada Metal Company has made a success, for the goods "bring" and "keep" customers. Repeat orders are the proof, and repeat orders are what pay.

W. G. Harris, the general manager of the company, who has lately returned from a visit to the Old Country, was congratulated on all sides for the very excellent display, and he and Mr. Harris, jr., were kept busy answering questions and describing the uses of the various metals exhibited.

SPLENDID JOB OF PIPING.

The illustration on this page, showing an interesting arrangement of water supply piping done by Arthur Savard, Omaha, Neb., in a residence in that city, reproduced from the Plumbers' Trade Journal, New York. It is certainly an elaborate job, with each fixture tagged, and on the blackboard in the centre of the fixture are corresponding numbers showing what each one represents.

THE "BEAVER" DIE STOCK.

Threading 1, 1½, 1¾ and 2 inch pipe with one set of dies, the "Beaver" No. 20 die stock of the Borden Co., Toronto, is a time-saving device. It pulls easy for the reason that the chasers are thin, only a few teeth—not much friction. They gradually open while threading, making it pull easier all the while, and makes the correct taper to make up tight in fittings. No time is wasted for changing dies, cleaning, wiping, etc. All that is necessary is to throw the handle around to any size. It cannot strip threads or cut wavy because a tension screw collar holds the chasers down tight in perfect alignment, preventing grit or dirt from getting under chasers. It also takes up any looseness or future wear.

The dies are long-lived because they are so made that each tooth does its equal share of cutting. The first tooth of each chaser takes a roughing cut; each succeeding tooth cuts a little deeper and the last tooth makes a finishing cut, forming a clean and perfect thread. It cuts over and under standard by simply shifting the lever same as for cutting different sizes and a straight thread can be cut by simply releasing the grip screws after the teeth are all caught. It is also an oil saver as the surplus keeps dripping on the thread while cutting and not on the floor. The chasers cannot slip as the inclination of the same is very gradual and it is locked to the



Interesting Arrangement of Water Supply Piping in an Omaha Residence.

dial plate simply permitting, not by any means forcing, the chasers to recede while threading.

CHEQUE STUB—BANK COLUMN.

Very few up-to-date concerns to-day are using the cheque stub as a means of

recording the cheques issued, and also the balance on hand at the bank. At first thought it may seem a dangerous practice to write a cheque without writing the stub to correspond, but with the use of a voucher number this may safely be eliminated. Almost every concern doing business with banking institutions uses a bank column in the cash book from which postings are made to the ledger. Of course, if a business is too small to warrant this, the bank balance may be carried along in the old way from stub to stub and postings made from the stub.

The accompanying form serves to illustrate the bank column and voucher number. It should be understood, of course, that any number of additional columns may be used for the distribution of expenses, etc.

When a cheque is issued, before being signed, the voucher number, which runs consecutively in the cash book, is inserted on the cheque and the entry is made in the cash book to be posted later to the proper account.

Cash Book - Bank Column.

Date	No.	Cash	Bank	Date	No.	Cash	Bank
No. 8	-	50 00		No. 9	Dep.	50 00	
"	Dep.		50 00	" 10	15		47 50
" 11	Cash	200 00		" 12	16		43 60
" 11	Dep.		200 00	" 11	Dep.	200 00	

Bank Column and Voucher Number in Cash Book.

Pay Attention to Shop Arrangement

An Address by H. F. Baillet at the Recent Convention of the New Jersey Association of Master Plumbers.

Surrounding circumstances greatly aid or hamper each of us in our shop arrangements. Rental values (and the men or firms who own their own buildings are circumscribed by the rental values thereof the same as those who rent) and comparative business situations of our shops govern to a great extent opportunity for advantageous shop arrangement. Then, again, every man has little or large peculiarities of temperament, and nowhere does this crop up more than in his shop arrangements. For all of these reasons it were folly to attempt a description of anything approaching what might be termed a model shop. In fact, we might run up against the same proposition as did the model man. Not many miles away there lives a man who is a confirmed pessimist. One day his good wife, trying to get him into a livable humor, said to him:—"Well, Dick, no matter what happens, you are at least a model husband." This rather chirped him up a bit, until it occurred to him to look into the dictionary, where he found the word model defined as a small imitation of the real thing. When he became more pessimistic than ever. So if I attempted to outline to you a model shop we would probably all land in the dumps. There are, however, several broad lines that we all can follow to our mutual advantage.

Must Be Adapted to Work.

We must first take into consideration that nine out of every ten shops are more or less—and generally more than less—jobbing shops. To this we must add the fact that in New Jersey generally we combine tin and sheet iron work, also steam fitting, with the plumbing business. Now take an ordinary average business of this character that has been established say 8 or 10 years, and you will find within its walls probably some 800 different kinds of articles of stock and some 150 different kinds or pieces of tools. Of course some get along with considerable less and some have considerably more, but the figures given will be about the average. Now it is a plain proposition that this material and these tools should be so housed that they can be got at quickly. The cost of unnecessary duplication of tools and material or the loss of time hunting for the things runs into many dollars with all of us even under the best shop arrangements, and with many of us it turns what might be a profit into a positive loss.

One of the main obstacles to orderly shop arrangement is the presence of junk, including not only old metals, but dead material of all kinds. Everything for which you have not a reasonably continual use is more or less junk, and everything of this kind it is cheaper to throw away than it is to keep. The biggest shop in the state is none too large for an orderly, systematic arrangement, and when we consider that the average business does not afford the rental value of more than sufficient room for our most pressing needs, it is the height of foolishness to save up a lot of what is practically junk in the expectation that it will come in somewhere sometime or other. Better sell it off for junk and treat yourself and the good wife to a theatre party than to have it laying around for years, continually moving it about from one corner to the other, paying out more in spot cash for wages handling the stuff than we could replace it for several times over should we find the time come when we want to use it. We are all of us more or less dealers in junk. Then let us act like sensible dealers would and turn it into money, or, if that is not possible, at least not spend any more money in handling, but throw it out.

Have No Dark Corners.

Having got rid of our junk, let us next get rid of the dark corners where we shove things to get them out of the way. It is surprising how much money lies around in the corners of most every shop. It will pay us to clean out every corner and board it up. Every cubby hole that is not in plain sight and the goods in which are not profitably moved within a reasonable time is practically a hole in your pocket. "Sew it up."

This brings us to the subject of light. Wherever it is possible to get your light from the sky, do so. Skylights are by far the best means of lighting a shop. And not alone do you obtain better light, but you gain the wall space, which otherwise would be taken up by windows, for bins and racks, and of these you cannot have too many. A friend of mine recently built a new shop. He wanted plenty of light so he had more than half of his wall space windows, and found that he was obliged to put his fitting bins down cellar. Another place I know has no windows at all, but two generous skylights with practically half the glass exposure of the other man's windows, giving more

and better light, while there is plenty of room for twice the number of fitting bins that the first mentioned has, and it is not necessary to grope around a semidark cellar for anything.

Arrangement of Fitting Bins.

In speaking of fitting bins there is in no one thing a greater diversity than in this particular convenience, both as to location and arrangement. There can be no question as to the advisability of a sufficient number to house all goods of their kind separately so far as possible. As a usual thing this matter is most especially a matter of development. The beginner will stick up a few bins in the handiest place. As the goods accumulate he finds it necessary to put up a few more bins in the next handiest place, and so we will usually find bins stuck in all conceivable corners of the shop, fittings, trimmings and parts more or less jumbled together. It is no uncommon thing if you should go into a shop for a fitting to have the help say, "I will look for it." If it is not in one place, they will say, "Wait a minute, perhaps it's in the other bin." Now if it is necessary to spend 40 cents' worth of time to ascertain if a 10-cent fitting is in stock it becomes manifestly cheaper to buy another than to look. And this is usually done. The consequence is an accumulation of stock that does not move, but keeps piling up unnecessarily. In other words, lying idle, goods becoming broken, parts becoming separated, fittings going out of date and the place becoming glutted with junk. In every case a loss of money. I have in mind a place that is so arranged that a new journeyman or helper can learn where to find most anything in short order. Fortunately space was available.

Fittings Classified and Separated.

First, steam goods and fittings, soil pipe and fittings and water pipe and fittings are in entirely different parts of the shop. Then the arrangement of the bins is unusual. Instead of starting out with the largest size fittings and having the bins run on in rotation, the fitting bins are arranged in sections. The centre section contains the most used sizes, and this section again is laid out so that of this the most used stock is directly at from waist to eye height from the floor. Standing in the centre of the wall space the eye first sees and the hand reaches $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$ in. fittings, ells and tees. Here again straight ells and tees are all at the extreme left, reducing fittings following, street ells, crossovers and similar odd fittings being either in a straight line to the right or on a line vertically from the initial fitting. The upper part of this section, working from left to right and from the top down, contains

1-in. and reducing fittings. The next section toward the right contains $1\frac{1}{2}$, $1\frac{1}{4}$ and 2 in. fittings, and the last section contains in the upper half pipe straps, fasteners and miscellaneous appliances, while the lower half contains bushings, caps, plugs, etc., from 1 in. upward. The sections to the left of centre contain in upper part brass fittings and in lower part fittings below $\frac{3}{4}$ in.; also all unions are in one row, bushings from $\frac{3}{4}$ in. down in rotation.

A card is handy, one glance at which tells where to look. The central idea is that the medium size most used things are in the centre, larger to the right and smaller to the left. The lower tiers below waist line are given up to nipples, and here again $\frac{3}{4}$, $\frac{1}{2}$, $\frac{3}{8}$ and 1 in., the most used sizes, are in the centre, larger on the right, smaller on the left; upper half, galvanized; lower half, black. The scheme can be varied, of course, to suit conditions. The advantage is that the underlying idea is applicable to different conditions. The underlying idea evidently is to have all fittings for one branch of work together, having the different branches separated, and having in each branch the most used or medium sizes in the most accessible and easiest seen part, the larger adjoining in one direction, the smaller in another, with least often used stock on what might be called the outskirts.

Care of Brass Goods.

We find usually a great difference in location of brass goods. The haphazard way of using any unoccupied space that may present itself has its adherents. Also the arrangement of keeping them under lock and key. Where there is office or store help we frequently find the brass goods in that part of the establishment which is constantly under the eye of whoever is in charge of the store or office, and those getting out these goods are required to have them charged in the office.

The comparative importance of store and office vs. shop proper also shows much difference of opinion in arrangement. A plumbing, tin or pipe fitting shop proper is not exactly "a thing of beauty and a joy forever." It is more apt to be a dirty, greasy place, full of smells and other things. "Old passee" water closets, with broken horns, dilapidated seats with half a hinge, or parts of hydrants and closet valves, floaters, levers and battered sprinkling cans are not attractive to the customer. If real estate conditions and the chancellor of the exchequer allow, have a large store fitted with up to date fixtures. If not, have an office, but don't rob yourself of shop room, of storage room, of working room, for the sake of throwing a big front with

your office. Neither should we expect our customers to come into the shop to transact their business. Have as nice a front as your business will permit. Let it be ever so small, but let it be nice. A desk set into a workshop will do in a pinch, but it is just as much out of place as a bull in a china shop.

A little wrinkle I saw a while ago and copied with great advantage is a mezzanine floor. Where the ceiling is 12 or more feet high a hanging floor on one or more sides of the wall will provide considerable additional floor space, in many cases enabling one to have practically two rooms in one, with the accessibility of one large room and the subdivision of two.

Storing Short Pieces of Pipe.

Most all shops accumulate quantities of short pieces of pipe, which is generally piled up in one corner, to be sorted out every time a man wants a certain length piece, with the result that when the boss is not looking he will cut a length sooner than look the pile over, with the result of further accumulation of still more pieces. A neat wrinkle in one shop was a bin with slanting sides, starting with 1 ft. width on top and coming out 3 or 4 ft. at bottom. This was divided vertically for sizes of pipe and horizontally for lengths of pieces. In putting pieces away a man could not put the piece in the wrong compartment, because it would be too long or too short, the length being governed by the depth of the bin, and in wanting a piece of any certain length it was very readily found. The cost of this arrangement was merely some rough boards and perhaps at most a day's time. The saving in wastage and time every year is considerable.

Collapsible work tables, pipe benches, etc., are all items of shop arrangement that save rent and make for compact stowage and saving of space. Of course the main thing in all shop arrangement is order. Order and system save you time, money and temper. It saves doctors' bills and vitality.

Care of Pipe-Threading Dies.

Some time ago, when attending a master plumbers' meeting, two of the brethren were discussing the advisability of having pipe dies recut. A third remarked that such a question never troubled him as pipe dies were usually lost, strayed or stolen before they had a chance to get dull. In another shop the loss of pipe dies is reduced to a minimum. Each set of stocks and dies is kept in a sheet iron box, and no separate dies are allowed to be taken on a job. The journeyman is obliged to take out a complete set in a box, and is held responsible for the return of that set. One set of small and large stocks is

kept at the shop vise with dies. These sets are not allowed to be taken out.

Another employer has a tool closet in his office, in which are shelves and hooks for shop tools. Pipe wrenches from 18 to 48 in., drills, sledges and the large number of shop tools have their place. When the occasion for their use arises a ticket is hung up for any tool taken out. This ticket contains the name of the journeyman taking the tool out and the date, and the journeyman must see that he obtains the ticket when the tool is returned to the office, otherwise it is charged to him. A glance in at the open door shows what tools are in and if out where they are at.

System Contributes to Success.

Some time ago when in company with a bunch of craftsmen, as sometimes happens, they were discussing the success of an absentee. The remark was made that he had a finely appointed shop. One young member replied, "Yes, and I'd have the same if I was as successful as John is. If I had his money." A little inquiry brought out the fact that John had started with no more than the average master plumber, but had, from the first been noted for his neatness and his pride in his business environments, always making improvements and keeping his place up to the mark. The question came to me very forcibly, Has John a finely appointed place because he is successful? Or is he not rather successful because of his systematic and orderly shop and business arrangements? It's worth thinking over.

"DON'T TIP THE BASIN."

American travelers in Europe find a great deal of trouble with the omnipresent need of tipping those from whom they expect any service, however slight. They are very apt to carry it much too far, or else attempt to resist it altogether. There is a story told of a wealthy but ostentatious American in a Parisian restaurant. As the waiter placed the order before him he said in a loud voice: "Waiter, what is the largest tip that you ever received?" "One thousand francs, monsieur." "Eh bien, but I will give you 2,000," answered the upholder of American honor, and then in a moment he added: "May I ask who gave you the 1,000 francs?" "It was yourself, monsieur," said the waiter. A Toronto plumber had quite an opposite experience when visiting London. Goaded to desperation by the incessant necessity for tips he finally entered the wash-room of his hotel, only to be faced with a large sign which read: "Please tip the basin after using." "No!" said the plumber, "I will go dirty first!"

Nova Scotia's Provincial Association

Halifax Master Plumbers Take Action to Bring the Trade Throughout the Province Into One Central Organization
—Ontario's Turn Next.

At a recent meeting of the Master Plumbers' Association at Halifax, it was resolved that in the future the association would be known as the "Master Plumbers' Association of Nova Scotia," instead of the "Master Plumbers' Association of Halifax and Vicinity." The object in changing the name is to encourage every master plumber in Nova Scotia to join and take part in the work, as the association for the protection of the trade and the public must be strengthened. It was also decided that members in arrears for dues would be re-instated for the sum of nine dollars per capita tax, and dues for 1908.



FRANK DEXTER, TRURO,

Vice-President for Nova Scotia in the National M. P. A.

The draft act of incorporation of the new Nova Scotia Provincial Association reads as follows:

Act of Incorporation.

Whereas the persons hereinafter named have, by petition, set forth that it is desirable that they, together with such other persons as may hereafter be associated with them, be incorporated into an association by the name of "The Master Plumbers' Association of Nova Scotia," having for its objects and purposes the following, namely:

(a) Promoting the advancement of the

trade in its sanitary, commercial and scientific departments:

- (b) Protection against imposition, injustice and encroachment upon its common rights and interest:
- (c) The education of its members and the improvement by its members of the plumbing trade generally:
- (d) The dissemination, among the public, of sanitary science and its principles:
- (e) The mutual assistance of its members.

And whereas the said persons have prayed that it be enacted as hereinafter set forth and it is expedient to grant the prayer of the petition as follows:

Be it enacted by the Governor, Council and Assembly as follows:

1. James G. Crump, John Meyers, John McFatrige, Michael Burns, G. A. Wooten, George Perrier, W. S. Craig, John O'Toole, Richard Kinsman, James Farquhar, all of Halifax, in the County of Halifax; Frank Dexter, of Truro, in the County of Colchester, and John Ritchie, of Dartmouth, in the County of Halifax, and all other persons as hereafter may be associated with them, shall be and they are hereby constituted a body politic and corporate under the name of "The Master Plumbers' Association of Nova Scotia."

2. The association shall have the right to purchase, acquire, and hold all lands and property necessary in order to carry out the objects and purposes for which incorporation is sought, provided that the value of the real estate held at any one time for the actual use of the association shall not exceed ten thousand dollars (\$10,000); and may mortgage, sell, lease, rent, assign or otherwise dispose of the same as may be deemed expedient and in the interests of the corporation.

3. The association shall have and possess the power to make or become parties to promissory notes, bills of exchange and negotiable paper made, drawn, accepted or endorsed or otherwise executed in accordance with any by-law of the association made in that behalf, and every such instrument executed as aforesaid shall in no case require the seal of the association to be affixed and no officer of the association so making or drawing or accepting or endorsing any such instrument for the association shall be individually liable thereupon.

1. The constitution, rules and by-laws of the association now in force respecting the admission and expulsion of members and the management and conduct generally of its affairs and concerns in so far as they are not inconsistent to the laws of this province shall be the rules and by-laws of this association, provided, always, that the corporation may from time to time alter, appeal or change in whole or in part such rules and by-laws in manner provided, and all such by-laws and amendments shall when approved by the Governor-in-Council have the force of law until repealed.

5. All property now owned by or held



G. A. WOOTEN, HALIFAX,

One of the Incorporators of the New Provincial Association.

in trust for the association is hereby vested in the corporation and shall be applied solely to the purposes of the corporation, and all debts, claims for subscription or contributions of members and other rights accruing to the association under its constitution and by-laws shall be vested in the corporation constituted by this act; and the corporation shall be charged with the liabilities and obligations of the association.

6. No member of the said corporation shall be liable for the debts of the corporation beyond a sum equal to the amount of his indebtedness to the cor-

poration unless he shall have made himself personally liable therefor.

7. Any member of the association, not being in arrears, may retire therefrom and shall cease to be such member by giving notice on the forms required by the by-laws and thereafter shall be wholly free from liability for any debt or engagement.

8. Every member expelled or voluntarily retiring from the association or whose name shall be struck off the list of members for any of the reasons men-

tioned in the constitution and by-laws, shall forfeit the rights of membership.

9. The rents, revenues and profits, arising out of every description of moveable or immovable property belonging to the corporation, shall be appropriated for and employed in the exclusive use of the corporation, the construction and repair of the buildings required for the purposes of the corporation and the payment of expenses legitimately incurred in carrying out any of the objects relating to the aforesaid purposes.

\$26,000; four-room addition to Beale Street school and new heating system, \$9,000; improvements to the Collegiate, \$2,400.

The new hotel proposed to be erected at Fort William by Mr. Cuthbertson, will cost \$250,000. If satisfactory arrangements can be made, Mr. Cuthbertson will also erect a number of modern houses in the suburbs of Fort William.

Testing the roughing in plumbing work with all the lead work attached was formerly the rule in New York City, and various devices were resorted to to expedite this work. Among others was a closed end lead bend for the closet setting, which bend after the test could be cut off flush with the floor. The rule has since been rescinded and now soil stacks are tested without lead work. The old rule was a source of considerable expense and annoyance to plumbers, as often after the roughing-in work had been put in all the plumbers left the job for several weeks until the work was finished, and in the meantime there was apparently a systematic stealing of all the lead work.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

BACK VENTING AGAIN.

Editor Plumber and Steamfitter:

In the discussion on back venting which appeared in your issue of Sept. 1st, one writer says that in the case of a washout closet, and where the ordinary drawn trap for other fixtures is used, back venting is necessary, but if a syphon-jet closet is used and is placed within three feet of the stack it is not necessary.

Another writer thinks back venting necessary when bath and wash basin are connected to lead bend.

The experience of still another writer is that a water closet does not need back venting when on a straight stack, but wash basin and bath do.

Now, as your correspondents are all practical men, and their opinions are doubtless based on actual experience, they cannot be passed over with the commonplace remark that "They are mere theories," but it is not quite clear even to some who have made a study of hydrostatics, that a washout closet needs back venting while a syphon jet closet connected within three feet of a stack does not, nor is it easy to understand why a syphon jet closet more than three feet from a stack needs back venting, while one placed at less than three feet does.

Another hard one is that a water closet placed on a straight stack requires no ventilation, but bath tubs and wash basins do.

The action of the syphon is simple and is easily understood, so also is the syphoning of traps, but it is hard to understand the pranks of the law of hydrostatics as related by your correspondents, and I for one will be a very interested reader of such further elucidation of the subject as you may find opportunity to give.

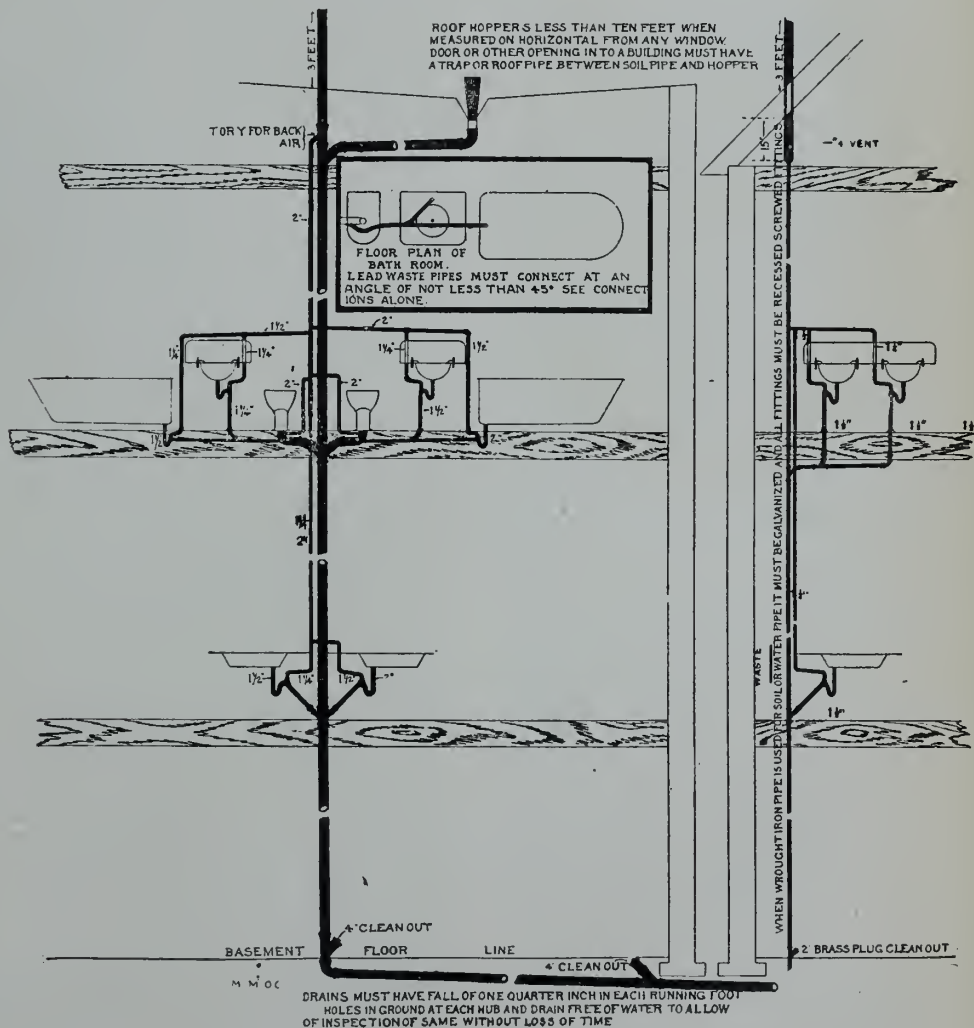
VET.

West Toronto, Sept. 10.

TRADE NOTES.

Woodstock, N.B., Board of Education has decided to ask for the sum of \$40,000 for school buildings, improvements, etc., to include New Delatre Street school building, enlarging ground, etc.

OTTAWA PLUMBING CHARTS—NO. 2.



CONTRACTS AND BUSINESS OPPORTUNITIES

Waterworks and Sewage.

The trunk sewer at Preston, Ont., has been completed.

The instalation of waterworks in Melbourne, Que., is being considered.

The trunk sewer and sewage disposal plant at Waterloo are now completed, the cost was \$26,993.08.

The Town Council of Orillia has decided to submit a \$10,000 by-law to the people for waterworks purposes.

Provincial Engineer Gamble has asked leave to connect the school in Hastings township with the Vancouver city water service.

Extensions will be made to Vancouver's waterworks system on Seventh Avenue, Thirteenth Avenue, Venables Street and Alder Street.

A quarter million dollar pumping plant to supply Edmonton and Strathcona with water is the suggestion of Edmonton's waterworks superintendent.

Wm. Mitchell, Niagara Falls, has been awarded the contract for the construction of the septic tank at the disposal works on Packham's Flats, Brampton, at \$4,585.

The work of laying the water mains in Palmerston will soon be completed, and the other work in connection with the instalation of the waterworks system is being pushed.

Cobalt Town Council and the Township Council have come to terms regarding the proposed waterworks and sewerage systems for the town, and the work will now be proceeded with.

The Ottawa Board of Control has decided to apply at once to the Railway and Municipal Board of Ontario for authority to begin work on the new aqueduct. What is proposed to be done at this juncture will cost \$52,000.

Tenders will be called for the construction of a pumping well and the making of connections between the conduit and pumping mains at Point St. Charles, in connection with Montreal's waterworks system. The cost will be about \$25,000.

Steps are being taken by Ottawa to acquire the land needed for septic tanks and bacteria beds for the Ottawa South drainage system. Work will not commence till the Provincial Board of Health sanctions the plan, but the City Engineer is advised that this will be done some time in September.

The Prince Albert waterworks extension contract for the year is nearing completion. The pipes have been laid, and the hydrants put in place. This year's work, when finished, will give a greatly increased area of water service and fire protection. Prince Albert now claims to be one of the best fire-protected towns in Western Canada.

Both Ridgetown and Blenheim are due to receive natural gas in very short order, Superintendent Dowd, of the Voicanic Oil and Gas Company having purchased the necessary pipe for the lines to these towns from the Tilbury and Romney fields. Both places will have gas by December 1, and gas fitters may look forward to a busy season.

The tender of the Minneapolis Steel & Machinery Co. was accepted for the new waterworks stand-pipe at Lethbridge, at a cost of \$13,365. The Canadian Iron Foundry Co. received the contract for supplying the 12-inch cast iron pipe for the force main, at \$45.80 per ton. The contract for hydrants, valves, etc., was divided between the Kerr Engine Co. and the Canadian Fairbanks Co., the total cost being in the neighborhood of \$2,600.

Public Buildings.

Lethbridge is building a \$30,000 fire hall.

Brandon will erect a new court house at once.

A public library will be erected at Harriston, Ont.

A new court house is to be built at St. Pierre, Man.

A new armory building will be erected at Durham, Ont.

A new armory will be erected at Joliette, Que., this Fall.

It is proposed to erect another school near Buckingham, Que.

A new Baptist Church will be built at Saskatoon, at a cost of \$5,000.

A new Methodist Church is proposed to be erected at Fairview, B.C.

Fishing Lake, Sask., school district will build a new school house.

Tenders are asked for the erection of a brick school at Deloraine, Man.

The Inverness County Court house at Port Hood, N.S., will be remodelled.

A new school will be erected in Amherstburg, Ont., at a cost of \$25,000.

The Baptist Church, Paris, Ont., will be considerably enlarged and improved.

James McClelland has just taken tenders for a new school at Cobourg, Sask.

A new post office will be erected at Glencoe, Ont., at a cost of about \$12,000.

The Estevan, Sask., school board are asking the council for \$7,100 for school purposes.

The Brantford & Hamilton Radial Co. will erect a new station building at Brantford.

The congregation of the Presbyterian Church, Stratton, Ont., will erect a new edifice.

The congregation of the Yonge Street Methodist Church, North Toronto, will erect a new church.

The Quebec Catholic Schools Commis-

sioners will erect a new \$4,800 school building in that city.

The William Beatty Company, of Parry Sound, will build a registry office and jail at Parry Sound.

Large frame school houses will be built at McBride, Quesnel, Black Mountain and Courtenay, B.C.

Contractor Cook, Vancouver, has the contract for the \$20,000 enlargement of Christ Church at that place.

Elora is to have a \$12,000 Government armory, according to a high official. A site has been chosen.

Tenders were recently received for the reconstruction of No. 2 fire hall, Winnipeg. The work will cost \$15,000.

The congregation of the Church of Christ, Winnipeg, is contemplating the erection of a new church building.

The trustees of the Queen's Avenue Methodist Church, New Westminster, have decided to enlarge the church.

Finnie & Gordon were awarded the contract for building St. James' Methodist Church, Peterboro', at a cost of \$9,765.

The M. E. Keefe Construction Company has been awarded the contract for remodeling the post office building at Halifax.

At a meeting of the Montreal Finance Committee the sum of \$56,550 was voted for the rebuilding of No. 20 fire station.

Estimates are being prepared for remodeling the Ottawa City Hall. A by-law will be submitted to the ratepayers in January.

The Catholics in the west end of Halifax are negotiating for some lots on which they propose to erect a new church building.

The contract for alterations and additions to the isolation hospital, Victoria, has been awarded to A. E. Balfour, at \$1,200.

It is possible that a new jail, costing about \$100,000, will be built at Ottawa during the year, as the present one is not large enough.

The St. John, N.B., Civic Ferry Committee has awarded a contract to J. H. Burley for improvements to the east side ferry toll house.

The St. John, N.B., Board of School Trustees have awarded the contract for the annex to the Winter Street School to R. A. Corbett, at \$33,868.

The building committee of the Ottawa Separate School Board will recommend the purchase of property in Hintonburg for the erection of a school building.

The contract for the new court house to be erected at Arcola, Sask., has been awarded to Thos. Grayson, of Moosomin, Sask., at a contract price of \$27,045.

The Saskatchewan Board of University Governors are looking over the chief cities of that Province with a view to

choosing a site for the Saskatchewan University.

A by-law has been passed at Brownlee, Sask., authorizing the raising of \$8,000 for the erection of a school, work upon which is to be commenced this Fall.

The J. McDiarmid Company, Winnipeg, has been awarded the contract for the new municipal hospital building to be erected at Saskatoon. Contract price, \$47,490.

G. H. Jost, Halifax, has prepared plans for a 50-foot addition to be erected to St. Andrew's Catholic Church, at Yarmouth, N.S. The improvement will cost \$20,000.

C. W. Hall, Brandon, has been awarded the contract for the erection of a new six-room school building at White-wood, Sask. The building will cost approximately \$15,000.

The Winnipeg Board of Control has awarded the contract for the proposed addition to be erected to the Carnegie library, to J. H. Trombloy, at a contract price of \$27,951.

The Six Nations' Indian Council has voted \$2,200 towards the erection of a new \$3,000 Fair building at the Ohsweken, Ont., Fair grounds, to replace the one recently destroyed by fire.

At a meeting of the trustees of Mount Pleasant Presbyterian congregation, Vancouver, plans were accepted for the new church building, to be erected at a cost of between \$35,000 and \$40,000.

H. H. Mott is preparing plans for an addition of six rooms and exhibition hall to Harkins' Academy, Amherst. The building will be heated throughout with steam, the contract for which has been let to Hazen & Co., Amherst.

The contract for excavation, foundations and stone work for the new Edmonton court house has been awarded to Alderman R. J. Manson, at contract price of \$165,000. Contracts for heating, plumbing, etc., will be let later on.

The officials of the Herkimer Street Baptist Church, Hamilton, have purchased a lot upon which will be built the proposed new church. Although the plans have been prepared, work on the erection of the new church will not be begun until next Spring.

The contracts for the Harriston Carnegie Library have been let by Architect W. E. Binning, of Harriston, Listowel contractors receiving the majority of the contracts. W. G. Scott & Co., Mt. Forest, will do the tinsmithing, and H. Meicklejohn, Harriston, the plumbing.

A contract for the construction of magazines for the Militia Department in Toronto, has been awarded to Anders Jordal, the price being about \$3,500. The contract for the construction of a public building at Glencoe, Ont., has been awarded to George A. Proctor, of Sarnia, the price being \$1,600. The con-

tract for a public building at Welland is awarded to Nagle & Mills, of Ingersoll, the cost to be about \$26,500.

General Building Notes.

E. B. Williamson, Toronto, will put up a \$16,000 dwelling.

Telfer Bros., Collingwood, will enlarge their business premises.

R. Jacob Singer will erect a \$30,000 apartment house at Toronto.

Love Bros., Toronto, will build six dwellings at a cost of \$15,000.

H. W. Raymer is building a business and office block at Kelowna, B.C.

J. S. Moore, Toronto, will erect three pairs of dwellings at a cost of \$10,500.

Architect Whiteway, Vancouver, has taken out a permit for a \$16,000 block.

A \$30,000 office and hall building will be erected at Toronto by S. T. Sutton.

The Conservative Club, of London, is contemplating the erection of a large club house.

Kingston will loan \$100,000 to any company that will build a \$150,000 hotel at that place.

Lim Dat, a wealthy Chinaman, of Victoria, will erect a \$25,000 business block at that place.

A new reading-room addition is being built to the University of New Brunswick, Fredericton.

The Eastern Townships Bank will erect a three-storey bank building at Grand Forks, B.C.

E. D. Tuttle, Winnipeg, is preparing plans for an apartment block to be erected at that place.

John Allan, Montreal, has the contract for the erection of a \$17,000 dwelling for Mrs. Alex. Woods.

William Baxter, Hamilton, has been granted a permit for the erection of five dwellings, at a cost of \$10,000.

G. N. Faust, Montreal, has been granted a permit for the erection of three houses, at cost of \$18,000.

A permit has been granted to A. Calori, Vancouver, for the erection of a hotel building, to cost \$80,000.

A permit has been granted to James Curran, Peterboro', for the erection of a frame dwelling, to cost \$9,000.

A. Osterhout, Winnipeg, has been granted a permit for the erection of three dwellings, at cost of \$9,000.

It is stated that the C.P.R. will construct another wing to the Empress Hotel, at Victoria, at an early date.

Mrs. F. J. Reed, Winnipeg, has been granted a permit for the erection of four dwellings, at a cost of \$10,000.

John Williamson, Montreal, has been granted a permit for the erection of a pair of semi-detached dwellings, to cost \$17,000.

Parks & McDonald will erect an apartment house opposite the Secord hotel, Vancouver, at an estimated cost of \$13,000.

H. & J. Hutson, Toronto, have been

granted a permit for the erection of three attached apartment houses, at a cost of \$20,000.

C. R. S. Dinnick has been granted a permit for the erection of a pair and three attached dwellings at Toronto, at cost of \$10,000.

Honore Mainguy, St. Foye, Que., has been awarded the contract for an \$8,000 house, to be erected at Quebec for L. F. Burroughs.

A block of land at Toronto has been acquired for the erection of a large apartment house, to cost in the neighborhood of \$35,000.

It is reported that the G.T.P. will build a large hotel at Rivers, Man., and that it will develop power and instal an electric light plant there.

D. McConnell, Ottawa, who owns the graphite mill at Port Elmslie, has purchased most of the village properties, on which he will erect dwellings.

Charles Price & Son, Aylmer, have secured the contract for the erection of a residence at Lyons, Ont., for H. O. Demary, at a probable cost of \$2,500.

The Young Women's Christian Guild, Toronto, have taken out a permit for the erection of a two-storey brick bath house and gymnasium, at a cost of \$10,000.

The Concrete Engineering and Construction Company, of Vancouver, will erect the first concrete business block in New Westminster, for A. L. Lavery, at a cost of \$13,000.

Dowler & Michie have prepared plans for a business block to be erected for J. C. Lenton and G. C. Robinson, at Calgary. The building will be three storeys high and will cost \$15,000.

Clarence Smith, Walkerton, has let the contract for an up-to-date feed store. Geo. Schwahn, of Mildmay, was awarded the contract for the carpenter work, and Alex. Haas the brick work.

Building permits were issued at Victoria recently to Foubister Bros., dwelling, \$1,000; Dr. J. A. Graham, two dwellings, \$3,000 each; Clarence B. Sylvester, dwelling, \$1,900; Jos. Phillips, dwelling, \$1,500.

Tenders are being called at Vancouver for the construction of the thirteen-storey sky-scraper of the Imperial Trust Company that will be erected in the heart of the city. Throughout, the building will be most modern, and will cost \$400,000.

Recent building permits at Ottawa include: E. Shuttleworth, dwelling, \$3,000; James Moore, dwelling, \$3,000; A. Killeen, dwelling, \$1,500; James E. Wilson, dwelling, \$4,000; Mrs. Sarah Fowler, dwelling, \$2,500; L. R. Gauthier, row, \$7,000.

The plunge bath which is being installed in the new Y.M.C.A. building, Ottawa, will be 18x48 feet, and lined with white tiles. It will be supplied

NEWS OF THE TRADE IN CANADA

with fresh water at the rate of 15.20 gallons per hour from the shaft which has been sunk to a depth of 1,189 feet.

Since the recent fire at Grand Forks, B.C., that city is recovering rapidly. Building operations are in progress and a better class of business structures are being erected. The Eastern Townships Bank has had plans prepared for a new three-storey fireproof building. The Yale Hotel is to be rebuilt without delay, and Frank Hartinger will also erect a new brick hotel.

Recent building permits at Winnipeg include: Mrs. A. G. Laing, dwelling, \$3,000; A. McTaggart, dwelling, \$2,000; A. K. Godfrey, dwelling, \$4,900; E. J. McMurray, dwelling, \$2,000; A. Coppling, dwelling, \$4,500; J. C. McNab, four dwellings, \$4,000; F. Thorpe, two dwellings, \$5,000 each; Charles E. Shore, dwelling, \$4,000; J. Mulvey, dwelling, \$4,000.

The Ferreo Concrete Construction Co. of Cincinnati has the contract for the erection of the new Europe Hotel at Vancouver, and the company has been registered in British Columbia. This contract was let without competition, the officials of the company getting hold of the proprietor when in the East and put matters so before him that they were able to close the deal.

Wilson, Son & Arnold are advertising for tenders for an addition to the Chatham Mineral Bath Hotel, to cost between \$10,000 and \$20,000, the operations on which will commence almost immediately. The Ursuline community, Chatham, are calling for tenders for a new concert hall, adjoining the Ursuline College, at an approximate cost of \$75,000.

Buildings at Asquith, Sask., have been going up at a rapid rate this Summer, and the town has a bigger and more important appearance than ever. The new brick school is completed and the Presbyterian Church is almost finished. This edifice cost about \$3,000. A new block has been built for Taylor & Creffield and work on the C.P.R. station is going ahead rapidly. The cement foundation has been completed, and the superstructure is now in course of erection. A section house will also be built by the C.P.R. A restaurant has been built near the C.P.R. station for Misses E. and H. Walker. Ground has been purchased on which a new post office building will be erected. Cameron Bros. intend building a store in which they will carry a stock of furniture, saddlery and farm implements. F. W. Nicholson is erecting a residence. A gang of men is at work building an elevator siding for the G.T.P. As soon as the steel is laid material will be brought along and two elevators will be built.

Landry & Allard, plumbers, Montreal, have dissolved.

Charette & Frere, plumbers, Montreal, have dissolved.

Wm. Nebbitt has opened a plumbing and gas fitting shop at Leamington.

Currie & Livock have the contract for overhauling the heating apparatus at the Ottawa Carnegie Library.

Martel & Langlier are installing the plumbing in the Real Estate Security Company's apartment house, Saskatoon.

C. J. Swan, of the Norwall department of the American Radiator Company, Chicago, was a visitor in Toronto last week.

Joe Morris, manager of the Montreal office of the Dominion Radiator Company, was a visitor in Toronto during the exhibition.

Frank Rogers, Blenheim, is installing gas services for McKay & Jaspersen, in

Ross & Co., of Brockville, are putting in the system.

E. L. Rilling, of the Hollands Manufacturing Co., Erie, Pa., manufacturers of plumbers' hand tools, vises, natural gas burners, etc., called on the supply trade in Toronto last week.

Ald. Harry Mahoney, Guelph, has been appointed on a committee to draft plans for a public comfort station in that city. Any information on this subject will be appreciated by the committee.

The Canadian Brass Works, Galt, are running again. The new management, with plenty of capital, are determined to make the venture a success. Last week thirteen tons of copper were received.

Mahoney Bros. have earned the gratitude of the citizens of Guelph for the water tank that they have in operation in front of their store on Quebec Street.



Standing beside the Fountain, but they Wouldn't Drink.

Harry Mahoney, Guelph; Frank Dexter, Truro; L. J. Conroy, John Watson, and J. E. Walsh, Montreal, at the Recent National Master Plumbers' Convention.

Blenheim, in connection with their natural gas franchise.

The Dominion Heating and Ventilating Co., Hespeler, are installing a heating and ventilating system in Knox Church and Sunday School, Dundas.

John A. Lambert, plumber, aged 35 years, died suddenly at St. Stephen, N.B., from uraemic convulsions. Mr. Lambert leaves a wife and two children.

Brickman & Baker, plumbers, Stratford, have dissolved partnership, J. Brickman selling his interest to D. Brickman. The firm name will be continued.

W. H. Anderson, Kempville, Ont., is having a new Pease hot water heating system installed in his residence. Geo.

The water in this is kept ice cold, and is much appreciated on a hot day.

M. Walsh & Co., Montreal, reported a fortnight ago as having "registered," performed that function fifteen years ago. Their present stunt, as should have been stated, is to register as a limited stock company with no change in the personnel.

H. J. Griffith, Welland, is having a busy season. He is installing 63 radiators in the hospital, and is working on a hot water heating system and plumbing in W. L. Rice's house. Then, he is putting in the fixtures in W. W. Wilson's tenement houses.

The Chatham Steam Heating Company will continue operations as before, the steam for the central heating plant

being supplied from the exhaust at the Chatham Gas Company's engine house instead of from the C.W. & L.E. power house, as heretofore.

Johnstone & McClymont, plumbers, Portage la Prairie, have dissolved partnership. F. Johnstone will in future carry on the business. Mr. McClymont has gone to Vancouver on a pleasure trip. From the coast he will go to Nelson, B.C., where he intends to go into business.

The contract for the installation of heating apparatus at Peterboro' armories has been awarded to the Bennett & Wright Co., Toronto, the price being \$5,000. The same company has been awarded the heating contract in connection with the west wing of Osgoode Hall, Toronto.

Galt plumbers have had a very busy season. Many new dwelling houses have been erected, and as these, without exception, are being equipped with modern conveniences, the plumber is naturally kept busy. Thos. Lockhart has found it necessary to add a delivery wagon to facilitate his business.

A meeting of the creditors of E. B. Welsby, plumber, Guelph, was held recently for the purpose of winding up the business as soon as possible. The stock and accounts were estimated at \$800, with liabilities of about \$1,400. The assignee, Sheriff Allan, was instructed to sell off the stock and wind up the business as soon as practicable.

A change has been made in the plumbing regulations in Galt. Heretofore it was only necessary for a plumber to make application to receive a permit to connect with a sewer for any private citizen. Inspection of the work thus accomplished was not satisfactory, and, accordingly, the council has ruled that in future permits must be taken out by residents themselves. The plumbers are pleased with the change as it relieves them of much responsibility.

J. J. Culletin and Alex. Cameron, two of Fort William's good-looking and good-hearted master plumbers, called at the Toronto office of Plumber and Steamfitter last week. They were busy seeing the exhibition and calling on the supply trade while in town. Both report a brisk trade developing and say the Fort William plumbers haven't yet got down to accepting contracts for the fun of working for nothing, as is the case in some other cities that can be named.

Dr. R. W. Bell, of the Provincial Board of Health, reports having inspected all the summer resorts on Kawartha Lakes, Maganetawan, Lake of Bays, Georgian Bay, Temagami, etc. There was an evident desire to observe sanitary conditions and keep them up to the mark. Some improvement was possible in a few places, and the worst feature

he noted was the careless disposition of kitchen refuse. Where water was taken from the lake sewage was also allowed to enter in close proximity to the supply pipe.

Chatham plumbers came in for some criticism at a recent meeting of the water commissioners. The by-laws require that before alterations can be made in any service, a permit must be procured from the board or its representatives. Since the board inaugurated its campaign last year to put meters on all lawn services, systematic work has been hampered through many plumbers going ahead without obtaining permits. The by-laws authorize the cutting off of a plumber's license where a permit was not secured.

Jackson & Yorke, Parkhill, have completed the plumbing of two lavatories and connection with a septic tank at the Hastings House, and have also installed the heating system in several new rooms in the same building. This firm is also installing the Kewanning Air Pressure hot water heating system in the Powell House. The water is pumped from the artesian well by a gasoline engine and forced to the boiler where an 80-pound air pressure is generated, which will force water higher than the building and may also be used for fire protection.

W. H. Ashdown, Vegreville, Sask., died at Swan River, Man. Born near London, Eng., he came to Canada with his parents, attended the Winnipeg schools and learned his trade as tin-smith and plumber with his uncle, J. H. Ashdown. He worked at his trade at various places in the West, putting in some years at the coast, afterwards at Carberry, Man., for some three years, then at Edmonton for two years. In the Autumn of 1905 he went to Vegreville and opened a shop, continuing the business until his death. He was about 36 years old and unmarried.

City Engineer Bell, St. Thomas, reported that the heating of the Locomotive Engineers' building would cost \$1,600, including the piping, pumping and installing a new pump at the power station. In addition to the Engineers' building he proposed taking in the hospital, Collegiate Institute, Scott Street school, fire hall, Y.M.C.A., and Catholic school buildings. To do this the present main would have to be taken up and replaced by a larger one, which would be sufficient for the entire supply. He thought that putting in separate systems or pipes would complicate matters very much. He had made no estimate of the cost, as he did not know to what extent the city would go in the matter of heating buildings. At present there is a four-inch pipe doing service for the city hall and public library. If a twelve-inch main were laid it would

heat nine times as much as that provided now. Any additional cost would be in the size of the pipe, pump and heating apparatus.

NEW GAS WATER HEATER.

The Ewart gas water heater, illustrated herewith, has been in use in the Old Country for several years, and there are now over 60,000 in daily use throughout Great Britain, where they are said to be rapidly displacing other systems.

This machine, which is now being introduced in Canada, is different from anything else on the market. It is instantaneous and automatic in its operation. It is only necessary to keep a small pilot light burning constantly.



Ewart Gas Water Heater.

The mere opening of a hot water tap in any part of the house automatically admits a full flow of gas to the burner, which continues as long as hot water is being drawn off, and ceases again the moment the tap is closed. By this means an inexhaustible supply of hot water, fresh from the tap, is available with the smallest possible consumption of gas.

The machine is made of solid copper, highly polished on the exterior, and is very ornamental. It is made in several sizes, suitable for a single tap, or a complete system for a whole house, hotel or office building. It is being introduced into Canada by the Ewart Heater Co., who have opened offices in the Merchants Bank building, Montreal.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Sept. 14.—Orders show an improvement, although there is no distinct spurt to business. The progress seems to be slow but steady, which is a guarantee that the betterment going on, is a substantial one and founded on strong foundations. Some lines are extremely busy, but considering plumbing supplies generally conditions are, as we have said, slowly on the mend. Most satisfactory returns were issued from the Montreal building permit office for August. Building operations took a decided turn for the better in that month and the permits issued were \$280,000 ahead of the same month last year. It is true that these permits were mostly for residential houses, but all the same the plumbing trade generally reaps the benefit.

If September shows a similar rate of improvement over the same period last year, the trade will enter into a busy season. Not that conditions have been so very bad all the way along. Plumbers generally have not been slack, but there has not been that rush and drive which delight the heart of employers. There has been a falling off in the large contracts for the city, although some big ones outside have fallen into the hands of Montreal men. But the steady erection of residential houses in the suburbs has afforded plenty of work for plumbers generally. Jobbing work has been very good lately, and some of the plumbers who do nothing else but this state that they have had little time to spare.

Prices generally are about the same, and probably with the increased work now showing the buying will be less cautious than it has been. Stocks are light, and there is no doubt with plenty of work assured, heavier buying will result, for hand-to-mouth purchasing eases its disadvantages, as every plumber knows.

IRON PIPE—Some good orders have been received lately, and encouraging trade has opened out. The increased number of permits issued has stimulated the demand, while purchasing seems to be less conservative than it was. Prices are unchanged. Cast iron and malleable fittings are in better demand at unchanged prices.

SOIL PIPE—This line is keeping up the improvement noticed in our last issue. Orders are of better bulk, and the stimulation of the increased building operations in the city and suburbs is already being felt. The country trade keeps good. Prices are unchanged, and we continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Lead pipe is moving in better volume. There has been a distinct improvement in the booking and it looks as if plumbers were beginning to stock up in larger quantities again. We continue to quote pipe and waste at 30, and traps and bends at 50.

SOLDER—Solder is in fair demand. The call from the roofers has not perhaps been quite so heavy lately, but plumbers generally have been ordering well. Prices are unchanged, and we continue to quote 19c for half-and-half, and 18c for wiping.

ENAMELWARE—The demand for enamelware has become very heavy, and supply houses and manufacturers report a busy time. A growing tendency is noticed among landlords to put in better class articles. Prices are unchanged in the best makes.

BRASS GOODS—The demand has improved, and good class articles are finding better sale. Prices are firmer, but generally there has been no advance. Fuller work and compression work are quoted at unchanged prices.

RADIATORS AND BOILERS—A good demand has set in, and manufacturers are busy attending to orders. The call is not only good from the city and suburbs, but the country as well. We continue to quote radiators at 52½ and boilers at 50 and 10 off. Steamfittings are 60 off, with a good demand.

METALS—Copper continues firm. Lead is weaker, but tin continues about the same, although it has fluctuated in the primary markets. We quote: Ingot copper, \$14.50; ingot tin, \$32.50; lead, \$3.50; pig iron, Middlesboro No. 1, \$18; Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 2½c.

TORONTO.

Toronto, Sept. 14.—All the jobbing houses present a busy appearance this week, but it is more because of the number of Exhibition visitors paying calls than that any extra business is being done. However, it all means business in the long run, for the out-of-town traders have seen new plumbing goods and were much interested in what they did see. If the frequent inquiries count for much, business should be good during this Fall and Winter.

Quotations remain unchanged from the last issue's figures. There are no rumors of shading in any line, and every jobber is feeling good with himself, the other jobbers, and the trade at large. So much for this annual intermingling of customer and jobber at Exhibition time.

IRON PIPE.—Prices are fairly firm. For 1-in. galvanized \$6.76 is asked, and

for 1-in. black \$5.11 is the price. Cast iron fittings are at from 62½ and 65, and malleable fittings run from 35 to 37½ off. Supplies are fairly large.

SOIL PIPE.—Demand is fair for this line and supplies are pretty good. Light pipe is 60 and fittings 70 per cent, while medium and extra heavy pipe and fittings remain at old quotations, 70 per cent.

LEAD PIPE.—Business is fair in this line and sufficient supplies are on hand to meet present demands. Pipe and waste at 30 and traps and bends at 50 per cent. continue to be the ruling quotations. Caulking lead runs from 4½c to 5c.

SOLDER.—A normal demand is made for solder, and supplies are large. Wiping is at 18c and half-and-half is at 19c.

BRASS GOODS.—Plenty of stock, unchanged prices and little business are the ruling features of the brass situation. Fuller work is at 70, and compression work at 65 per cent.

ENAMELWARE.—Large stocks are on hand, but there is also a good demand. Prices are unchanged at present from the old quotations.

BOILERS AND RADIATORS.—Continued lively sellers are these goods. Prices are the same as have prevailed for some time. Pretty good shipments are still being made.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in THE BOOKSELLER AND STATIONER, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, posters. The Hough Lithographing Co. Limited, Office, No. 3 Jarvis Street, Toronto Telephone, Main 1576. Art, good workmanship business methods.

IT PAYS FOR ITSELF.—The money you are now losing because you haven't a National Cash Register would pay for one in a short time. The National Cash Register Co., F. E. Mutton, Canadian Manager, 129 West King Street, Toronto, Ont.

ADDING TYPEWRITERS write, add or subtract in one operation. Elliott Fisher, Limited, 129 Bay Street, Toronto.

DRIFT PLUGS



PLUMBERS' TOOLS

Made from the highest grade
of material and fully guaranteed

TURN PINS



BIBB SEAT DRESSER



WRENCH



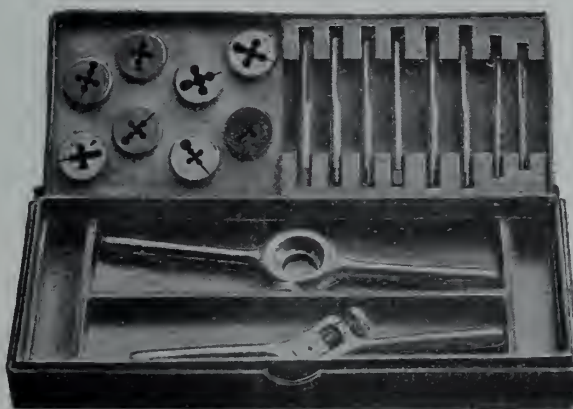
WASHER CUTTER



COMBINATION PLIER



SET OF TAPS, DIES, ETC.



SHAVE HOOK



CAULKING TOOLS



Contains Die and Tap of each following sizes : 6-32, 8-32,
9-32, 10-24, 10-28, 10-32, 12-24, 14-20.

**BENDING SPRING
HOLDER**



Several hundred tools illustrated in Catalog "F"

Canadian Wolverine Co.
Chatham, Ont.

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

Works at Valleyfield

If your nearest dealer does not handle our goods, write us.

EVERY PLUMBER AND STEAMFITTER

in Canada has some want which could be satisfied by a small condensed advertisement in our paper.

We reach twice each month almost every plumber and steamfitter from one end of Canada to the other. It seems reasonable to suppose that some one of our readers will want to buy just what you have to sell, or will want to sell just what you have to buy.

The rate is low. 2c. per word for the first insertion, 1c. per word for subsequent insertions. Send cash with advertisement to our nearest office.

PLUMBER AND STEAMFITTER

MONTREAL

TORONTO

WINNIPEG

THIS IS THE DAY OF

INVESTIGATION

Get in line and let us prove to you that the

GENUINE

Armstrong Stocks and Dies

ARE THE BEST.

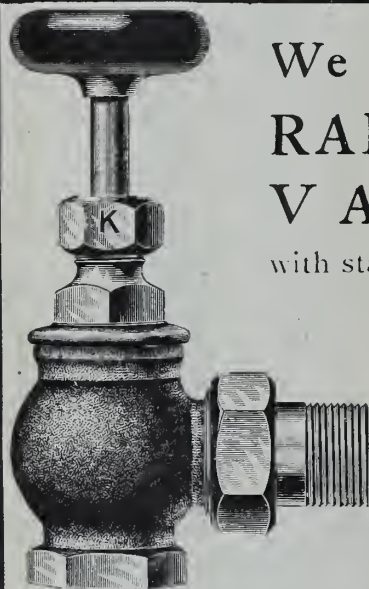
Catalogue on request.



The Armstrong Mfg. Co.

317 Knowlton St.

Bridgeport, - Conn.



Sizes 3/4" to 2".

We make these RADIATOR VALVES

with standard brass disc, and with the Jenkins Disc, with and without Unions.

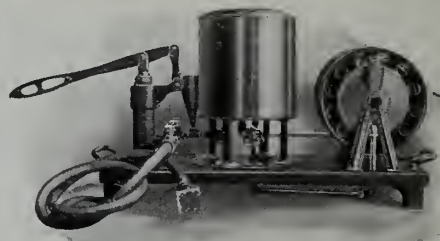
They are made from good metal, tastefully machined, and are handsomely plated and polished. Mounted

with best quality Wood Wheels. The Valves are right and the prices are right. All the large dealers sell KERR Valves. Ask for them. Our name is on every valve, and it guarantees the quality.

THE KERR ENGINE CO., LIMITED
WALKERVILLE, ONTARIO

PLUMBERS YOU WANT THIS!

if you have frozen pipes underground
ANYONE CAN USE IT. WILL PAY FOR ITSELF IN



A SHORT
TIME.

ASK FOR
BOOKLET

MACHINES
ON TRIAL

WHY NOT
WRITE US

THE BURBANK THAWING MACHINE CO.
BERLIN, NEW HAMPSHIRE, U.S.A.

INFORMATION

about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect all the items of information appearing in Canadian newspapers about any subject you are interested in. Our service is thorough. We don't miss an item. If you want all the current information about a pet subject, we can supply it at the lowest cost. By using our service you can keep posted on any subject.

WRITE FOR OUR FREE BOOKLET.

**THE CANADIAN PRESS
CLIPPING BUREAU**

232 McGill St., Montreal

10 Front St. E., Toronto.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto

Sovereign Radiators *are Reliable*

When you have finished installing a Sovereign Simplified Heating System you can leave the job with a feeling of confidence that it will give perfect satisfaction to your customer. Two of the things which go to make Sovereign Radiators superior to others are: larger connection at the feed pipe and greater heating surface to the loop. Before leaving our factory every Sovereign Radiator is thoroughly tested; so that every Sovereign Radiator sold can be absolutely relied upon.



TAYLOR-FORBES CO., Limited

Head Office and Works—GUELPH, ONT.

TORONTO—1088 King Street West
ST JOHN, N.B.—H. G. Rogers, 53½ Dock St.

MONTREAL—122 Craig Street West
QUEBEC, QUE.—The Mechanics Supply Company
CALGARY—The Baraes Company, Limited

WINNIPEG—The Vulcan Iron Works, Limited
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THE STANDARD Ideal CO.

LIMITED



¶ This is one of the many new designs in Lavatories, that we have now ready for the market.

¶ We are also making a number of Baths, Laundry Trays and Roll Rim Sinks, which are entirely new.

¶ Particulars of these can be obtained on application to our Head or Branch Offices.

Head Office and Factories, Port Hope, Ontario

Branch Offices and Sample Rooms:
Toronto, 50 Colborne Street; Montreal, 128 West
Craig St.; Winnipeg, 154 Lombard St.

The Labatt Manufacturing Co., Limited

MANUFACTURERS AND JOBBERS OF

Plumbers', Steamfitters' and Engineers' Supplies

High - Grade Plumbing Specialties,
Tools, etc.

367 Queen Street West
TORONTO

and

Bathurst Street
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PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL 232 McGill St.

TORONTO, 10 Front St. E.

WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 19. (New Series).

Publication Office : 10 Front St. East, TORONTO, OCT. 1, 1908.

Old Series, Vol. XX. No. 19

1908

DAISY

CIRCULATION

PERFECT CIRCULATION is as important in a Hot Water Boiler as in a human being.

POOR CIRCULATION is as common in Hot Water Boilers as in members of the human family.

GOOD CIRCULATION is absolutely necessary in the human to radiate good health, and in a Hot Water Boiler to radiate good heat, and lots of it.

THE DAISY.—Water circulation, is its strong point, balanced to a nicety—absolutely perfect—unapproachable.

RESULTS.—MAXIMUM HEAT, COMFORT AND EFFICIENCY
MINIMUM COAL CONSUMPTION, WORRY AND EXPENSE.

PROOF.—Over 30,000 satisfied users attest this fact.

WARDEN KING, Limited, Montreal

CLUFF BROS., Selling Agents, Toronto, Ont.

Your profit will be more, both in money
and reputation, when you instal a

GURNEY

900 Series
Steam Boiler

Because

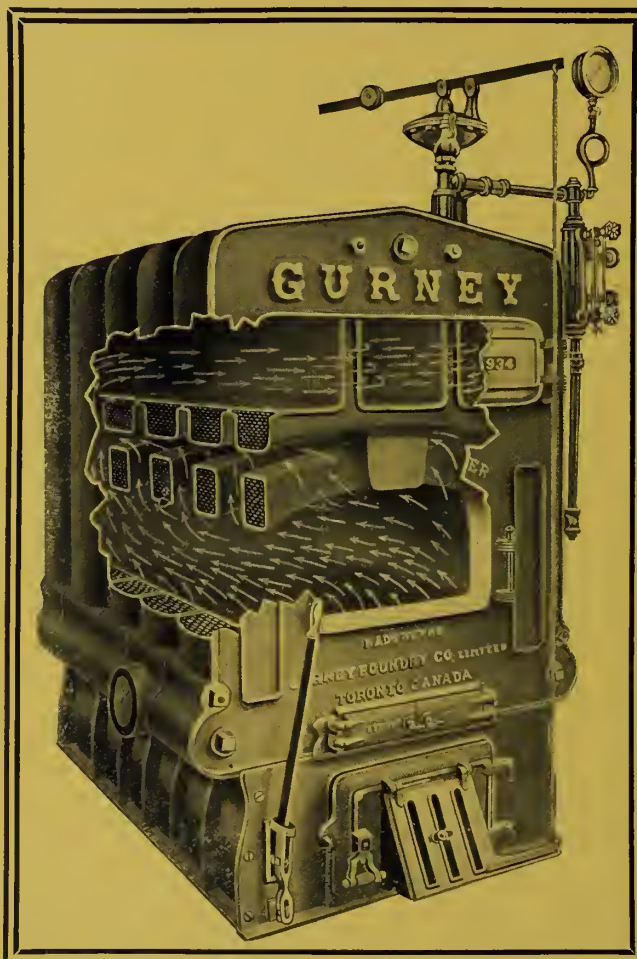
The Gurney 900 Series will soon show your customer that the long fire-travel, the deep fire-box and the extra water-arm directly above the fire are FUEL SAVERS that mean money in his pocket every hour the boiler is run.

Because

The ample bulk of water carried in the firebox-walls of the Gurney 900 Series insures a steady water-line, more reserve heat, greater fuel-economy and the abolishment of risk. Trust your customer to find these things out in actual use.

Because

The straight, self-cleaning firepot walls of the Gurney 900 Series will save the user a world of bother as compared with the irregular and sloped walls of other boilers. The customer will keep you in mind when he discovers what this saves him.



Because

The fitting strips set between section in the Gurney 900 Series Steam Boiler rid that boiler's owner of the bare chance of rust-cracks—and those are a common and costly nuisance in boilers whose sections butt close together.

Because

The deep firebox, large fire-door and agitating grates of the Gurney 900 Series Steam Boiler insure better combustion, easier tendance of the fire, and minimum waste of fuel—all points of every day value and importance to the man who buys the boiler—and to YOU.

Because

The cast-iron push nipple connections in the Gurney 900 Series make the customer secure against trouble with leaks, common to boilers that rely on rubber gaskets. Also, the water-line in the Gurney 900 Series is four or five inches below the top push-nipple, NOT in it.

Because—The Gurney 900 Series is Canadian-built, for Canadian needs—and it meets them better than any foreign-made boiler ever did. Study the illustrated Gurney literature, compare the 900 Series with any you know of—you'll know then where your biggest profit lies.

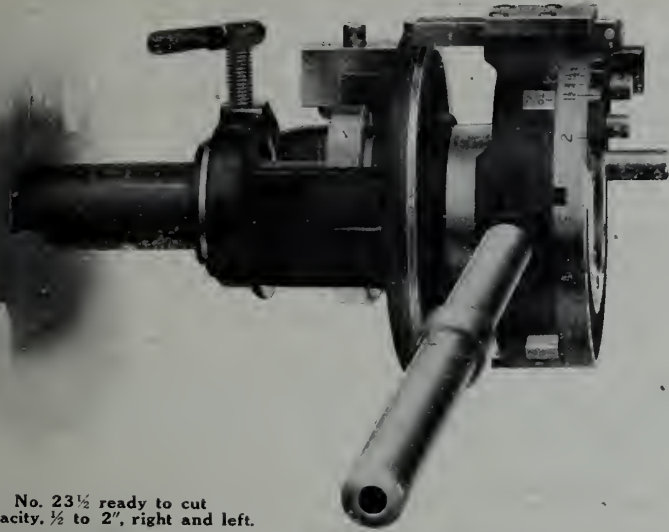
The Gurney Foundry Co., Limited

Toronto
Winnipeg

Hamilton
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London
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Montreal
Vancouver



No. 23 1/2 ready to cut
Capacity. 1/2 to 2", right and left.

The Narrow
**EASY
CUTTING
DIES**

for
Threading Pipe

Without a Leader Screw

This is just one of the points in regard to the new

"BUCKEYE" DIE STOCKS

MADE BY

The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

**Except You Have
Used**



our pure **Lead** in five pound blocks, you do not know the pleasure of caulking a joint. Used from Coast to Coast. Try it at your Supply House, if not in stock write us.

The Canada Metal Co., Ltd.

TORONTO

ONTARIO

WE WILL RISE

from the ashes bigger and better than ever. It is our intention to **build larger** and **better equip** our **new factory** to enable us to take care of our **ever-increasing trade**. In the meantime we are able to fill all orders promptly as our reserve stock is carried in our **Toronto Warehouse** and was not affected by the fire at our factory at Port Colborne. Mail Orders receive special care.

The Monarch Brass Mfg. Co., Ltd.

Office and Warehouse

278 Dundas St., Toronto

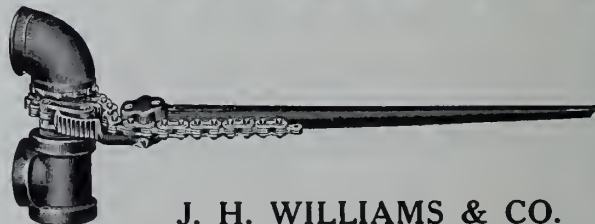


DISCARDED FEATURES

threaten you. See the chain? It will of its own weight fall from its locking pockets when working overhead. It threatens you with grave dangers when working in elevated positions. Discarded by us years ago, it is now being advertised as permitting a shift from one to other side of pipe without removing chain. It will permit the shift but it brings dire dangers with it because it

is not safe in all positions. We are pioneers in, and all our lives have studied, chain pipe tools. The "Agrippa" Single Jaw is without mechanical or construction fault—the only absolutely safe tool of equal capacity for crooked fittings or pipe. There's no other. Guaranteed and on trial from your dealer.

"AGRIPPA"



J. H. WILLIAMS & CO.

Pioneers in Chain Pipe Tools

BROOKLYN, NEW YORK

OUR "WANT ADS." get clerks for employers and find employers for clerks.

The Honeywell System of Hot-Water Heating

9,000 Systems in Use in America.



HONEYWELL
HEAT GENERATOR

We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

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MONTREAL, TORONTO AND WINNIPEG, OCTOBER 1, 1908

WHAT ABOUT BACK-VENTING?

In The Plumber and Steamfitter of September 1 a number of letters were printed on the necessity of back-venting, there being a considerable difference of opinion, as pointed out by "Vet." in the September 15 issue. In pointing out what he considered inconsistencies, "Vet." asked for a further discussion on the subject, but so far no reader has forwarded a contribution to continue the argument.

In this issue W. A. Ford and A. R. McGonegal, two members of the American Society of Plumbing Inspectors and Sanitary Engineers, express their views and the practice in Ottawa is illustrated by one of the series of charts showing the method of doing plumbing work in that city.

Short letters are requested from readers on the subject under discussion. Is back-venting preferable to the use of non-syphoning traps and, if so, under what conditions can the back vents be done away with?

BRITISH REPORT ON SEWAGE DISPOSAL.

For the past eight years a British royal commission has been investigating sewage disposal and various cognate matters. During that time four elaborate treatises have been issued dealing with such subjects as the suitability of various kinds of land for sewage treatment, the pollution of tidal waters, trade effluents and the nature of the remedial measures to be adopted. The fifth report published a fortnight ago is of exceptional importance, dealing, as it does, with the relative merits of the different methods available for the purification of the sewage of towns. Previous commissions had reported in favor of land treatment, and that method has hitherto been required from British local authorities. Since their enquiries, however, newer and cheaper schemes have been discovered and the commission now in being devotes the new volume to a comparison between the relative values of the earlier and later methods. In reaching their conclusions the commissioners have availed themselves of the exact bacteriological knowledge of which former commissions had not the advantage and for that purpose held 144 meetings and examined 199 witnesses, besides personally visiting a large number of sewage works and conducting special investigations and experiments.

The general conclusions of the commissioners is that it is practicable to purify the sewage of towns to any degree required either by land treatment or by artificial filters, and that there is no essential difference between

the new artificial methods of filtration and the older land treatment. In each case, they maintain, the purification, so far as it is not mechanical, is largely effected by means of micro-organisms. The adoption of one or other of these methods is naturally dependent, in their opinion, on the degree of purification that is required by the circumstances of the community immediately concerned, and of the stream or body of water into which the effluent is to be discharged. It also depends on the further question how, in the particular case, the degree of purification required can be most economically attained. The commissioners add that they know of no case where the admixture of trade refuse with the sewage makes it impracticable to purify the latter either by land treatment or artificial processes, although in certain extreme cases special preliminary processes may be necessary. They deal at length with the practical working of sedimentation and septic tanks, chemical precipitation with the relative cost of different tank treatments, and with percolating filters and contact beds. And it is noteworthy that they report no essential distinction between effluents from land and effluents from artificially constructed filters. The report is timely in view of the interest being taken in sewage treatment in Toronto and other Canadian cities.

WHY SO MANY FAILURES?

Confronted with a list of trade failures throughout Canada, one cannot fail to be surprised at the large number of plumbing firms included therein. Of course, in considering statistics for this year, the adverse trading conditions must be taken into account. The plumber has felt the pinch as much as any other industrial worker, perhaps in the majority of cases even more so. But after making due allowance for hard times, it is evident that there must be other causes at work to account for so many plumbing failures. This would not be so apparent had the large percentage of unsuccessful ventures been confined to 1908 alone, but in taking other years, such as 1907, when, up to October at any rate, trading conditions were undoubtedly in favor of business undertakings, the list of failures is a very heavy one. We must, therefore, seek for some other tangible reason beyond trade depression to account for this unfortunate state of affairs. And we have not far to delve.

It is more and more apparent that the rock on which so many enterprises have struck is that of business carelessness. The methods of a commercial house should be

the methods of a plumbing shop, modified maybe, but with the great principles upon which the former are based brought into use. How many journeymen starting out for themselves think of the clerical side of their venture? They know their trade as handcraftsmen, and in the majority of cases they think that this will carry them through. They open their shops, and start operations without any attempt to conduct things on business-like lines, and the result is that although jobs may be plentiful the end of the year finds a loss instead of a profit. Only then does it dawn upon these young firms that there are other points in the game beyond a proficiency in craft.

Of course the training of a young plumber is all against his possessing that commercial knowledge and experience which other men by the nature of their business have assimilated. But were the former only to realize seriously that he must join business methods with his capabilities as a plumber if his venture is to become successful, then, on the principle of the forewarned being forearmed, he would avoid many of those pitfalls into which others of his trade have fallen.

There are several salient points connected with a business venture which should be thoroughly grasped. In the first place the young master plumber should know at every stage of operations his assets and liabilities, not what they seem to be, but what they really are. A debit and credit account should be kept with all people with whom business is done. He should not leave these people to keep his books for him. There should be a proper agreement with all contract work, while the markets should be watched, and at the right time the right quantity of goods should be bought. It is a great folly to purchase any article that is not really wanted because the price happens to be low. Above all, there should be no undercutting of prices, as by that means necessary profit is sacrificed, and the scale of prices in the district, which it is in the interests of the plumber to maintain, is lowered. When a job is completed the bill should be promptly sent in.

All these points are not difficult to grasp. Any journeyman setting up into business for himself can put them into operation if he so desires without any commercial training to help him, and by so doing he can avoid those errors of business which are largely accountable for a large majority of the plumbing failures of to-day.

PLAN TO STUDY DURING THE WINTER.

Now that the long Winter evenings are approaching we would strongly advise every young plumber to undertake some course of study which will benefit him in his trade, and make him an all the more useful member of the community. There is no time like the Winter for educational efforts. Outdoor amusements are but few, and their enjoyment limited, and the home presents an attraction that does not exist at other times of the year. Thus, an opportunity is given for study which the ambitious man should not fail to take.

Of course, it is an easy matter to advise, and quite another thing to follow out the precepts. The effect of a hard day's work is felt as much in the Winter as it is in the Summer, and the consequent disinclination to do any more mental worrying just as hard to overcome. But in the Winter most of one's spare time is spent under cover, and reading of some description is the natural result. And if reading, why not take a step further and make the recreation an educational one. Of course, there

is a difference between ordinary reading and study. The one requires no effort of the brain, while the other does. But against this there is the transitory pleasure of a novel compared with the lasting good of a text book.

The great point in self educational work is to map out a schedule which must be strictly followed out. With a definite programme before him, we feel sure that many a young man who has hitherto devoted his spare Winter evenings to light reading would give a lot of that time to study. It is the desultory and spasmodic efforts at self-improvement that strangle and eventually kill the desire to improve one's knowledge. Now is the occasion for the young plumber to map out for himself some schedule of time to be devoted to study, resolving, likewise, that this schedule shall be religiously observed. Having done this, half the battle is won. Then comes the question as to the character of the study. Where night classes or correspondence schools are not available there is always the more experienced knowledge of the master plumber, or older workman to guide one, and text books are easily obtainable. Besides, the young plumber must be given credit for some knowledge of his work and some perception of what line of study it were best for him to pursue. And given this perception and the application necessary to carry out the study, the young plumber cannot fail or go far wrong.

There is a large variety of books on trade subjects available for study, any of which can be secured from the publishers of the Plumber and Steamfitter at the same price as quoted by the publishers in Great Britain or the United States.

ANOTHER BRASS FACTORY FOR TORONTO.

The Monarch Brass Manufacturing Company, whose brass factory at Port Colborne, Ont., was totally destroyed by fire a couple of weeks ago, inform The Plumber and Steamfitter that it is practically certain that they will select Toronto for the site of their new factory, which will be rebuilt at once on a much larger scale than their former plant, it being the company's intention to make a much larger line than before. The complete destruction of their machinery coupled with the constantly increasing demand for Monarch cocks and valves, will also make necessary the purchase of the most modern machinery procurable.

The fire happened at a very busy time, but the Monarch Company were fortunate in having a large reserve stock at their Toronto warehouse, and shipments to customers were, therefore, continued as usual. The firm's traveling representatives are again on the road and with factory and warehouse both located in Toronto the company will be in a better position to ship promptly to customers.

The new Monarch plant will add one more to the many industries connected with the plumbing and heating trade being centered at Toronto.

The Plumber and Steamfitter has no quarrel with the plumbing inspectors. We believe they should be given plenty of time to do their work, should be well remunerated and if there is too much work to be done by the present staff, the number of inspectors should be enlarged. The inspectors should co-operate with the master plumbers in seeing that the journeymen and apprentices are instructed in the most modern methods of doing their work. The inspectors should be teachers rather than policemen—but firm in cases of wrongdoing.

Floor Connections for Water Closets

Paper Read by J. S. Cassedy, Cambridge, Mass, Before the American Society of Plumbing Inspectors and Sanitary Engineers.

The subject of floor connections for water closets and slop sinks is one which merits the attention of every one who has anything to do with the installation of plumbing. I have long been of the opinion that the weakest link in the plumbing chain is the connection between the water closet and the lead bend, and a glance at the various plumbing codes proves that there is no unanimity of opinion as to how this connection should be made. For instance, many codes require that the joint shall be made tight with a rubber gasket, while others, among them the new Boston law, specifically forbids the use of rubber gaskets and requires that red or white lead shall be used. For my own part I believe that either of the above methods will generally prove unsatisfactory for the following reasons:

In order to make a perfect joint with a gasket of rubber a heavy brass flange must be securely soldered to the lead bend; this work is often very poorly done, especially on the cheaper class of work, and the result is a leak of sewer air at this point. If the flange is properly soldered to the lead bend the surface of the water closet may be so uneven that a tight joint is impossible.

Lead or Putty for Closet Connections.

There are several fundamental objections to the use of lead or putty for closet connections. If a marble floor slab is used the oil in the lead or putty is sure to discolor the marble around the connections and even where these conditions do not obtain putty makes a very unreliable joint, as the oil is soon absorbed by the floor, leaving a residue composed largely of whiting which is, of course, of little value in making a tight joint and is broken by any settling of the building which may occur. In my private practice I have for many years used grafting wax to make the connection, in cases where it was necessary to use a lead bend.

While I am not a believer in the lead bend method of connection, and this includes all connections which require a floor flange, I am convinced that when this method is used, grafting wax is far superior to any substance for use in making the floor joint, for the reasons that it will not stain the floors and it remains in a plastic state for many many years. I have taken up closets which have been set more than 10 years and

the wax was as plastic as when the closet was set.

Weights of Lead Bends.

No discussion on this subject would be complete without some reference to the weight of lead bends used for water closet connections, as it is of the utmost importance. It is a surprising fact that many plumbing codes fail to specify what weight may be used. I can imagine no greater inconsistency than to connect a water closet with an extra heavy soil stock by a 6-lb. lead bend (4 in.) The new Boston code requires that all lead bends of 4-in. diameter shall weigh 10 lb. per foot, which is a safe provision and should be generally adopted, not only as a sanitary measure but in the interest of economy. The difference in



Fig. 1.—Hopper of Wash-Down Closet.

first cost is practically nothing, while the cost of replacing a light bend is often \$25 or more. A word should be said in regard to the iron bends sometimes used for closet connections. While they may be superior to lead bends in point of durability, the same general objections may be raised against their use. They are often difficult to install and the floor joint is as unreliable as would be the case if a lead bend was used.

So far I have tried to show that the general practice of setting water closets with a joint of this character on the sewer side of the trap is dangerous to say the least. It is curious to consider that most codes forbid the use of unions or slip joints on the sewer side of traps, and then allow the inconsistency of permitting a putty joint—and in the final analysis that is what you usually get—under a closet, especially in localities where a fixture test is not given.

Closet Connections Under Seal.

This brings us to the consideration of the question: Has the time arrived when we may insist that all water closets shall have their connections under seal? I think so. For many years nearly all closets used in school-houses in New England have been of this type, and it is the only type which measures up to the standard set by the Boston School-house Commission. I have installed many of these closets and have found them perfectly satisfactory. They are made extra heavy and are seldom broken by ordinary usage.

Fig. 1 is a sectional view of a hopper, or wash-down closet, and Fig. 2 shows a jet syphon. As will be seen, the connection is in both cases below the water line. Surely, no argument is necessary to show the tremendous advantage obtained by this method of connection. The most doubtful joint in the plumbing system becomes the safest. All of the advantages of the present type of closets are retained and this great advantage added. It is my earnest belief that the time is here when every plumbing code should require that the so-called floor joint of every water closet and slop sink shall be hermetically sealed.

The one objection to the general use of this closet is the slightly higher cost, which would probably be reduced if there was a general demand for the closet, in which case a larger number of manufacturers would make them and competition would soon put the price at, or very near, the price of the present types.

Among those who have made smoke tests of old work and observed the effect of such tests upon the floor joints of water closets, there can be no divergence of opinion as to the desirability of eliminating this joint. The closets shown in Fig. 1 and 2 eliminate this joint and they do it in a manner mechanically satisfactory and scientifically correct. The roughing-in work and ventilation is simplified and we have the positive knowledge that there is no leak at the floor connection.

Discussion on Address.

In discussing the address by J. S. Cassedy, several members took part as follows:

H. J. Luff: I suggest that those types of water closet connections which are

made a part of the earthenware fixture in such a manner as is absolutely satisfactory, and that is screwed down to the connection at the floor line—such types of water closet connections are in my judgment much better than those suggested by Mr. Cassidy in his paper. Where there is an absolutely reliable threaded connection, such as is made by several of the manufacturers, it makes a very much better connection than that one specified.

Mr. McVea: Do I understand that Mr. Luff favors the rubber gasket on the closets he mentioned a minute ago?

Mr. Luff: No, indeed; I do not. I think most of you must be familiar with the construction where the brass member is taken and worked into the earthenware and held there by a satisfactory cement and bolted to that earthenware in such a manner that it will stand the screwing down into another brass member, which is connected with the house drain at the floor line so that it is necessary for that connection to be made absolutely perfect. It must be adjusted first of all to the point on which it will seat itself when it comes down, and will set in the right position when cemented with the brass member that is placed on the lead bend and adjusted to the iron pipe. The two brass parts must be so adjusted that the two faces, when they come together, will make an absolutely tight joint and will come into their place on the floor line. That is the method that is used by several manufacturers. I believe that kind of a connection is better than the one suggested by Mr. Cassidy.

Mr. Claffy: I believe that nearly all plumbers will agree that the screw type of connection is the best connection. Let us have a little opinion of the efficacy of the connection where a gasket is used. What about the fibre or the gasket made of asbestos, or wicking, or any of those substances? I think that the question discussed along that line would be a profitable thing.

Brass Floor Flange.

Mr. Cotter: In regard to the type of closet Mr. Luff just mentioned—screw closets—I cannot see that it is at all practicable to make any kind of a joint where you screw the closet to the supposed fitting on the floor. First of all there must be cement to connect the brass arrangement with the thread in the earthenware. That is objectionable in itself. I can imagine no earthenware fixture that can be gotten hold of to screw into a 4-in. pipe absolutely tight without running the risk of breaking the closet in making the connection. You must think of the expansion and contraction and the settlement of the building. The least jar to

a closet like that and the closet is gone. The least jar to a building where there is a screw connection to a closet and the closet is split and put out of use.

In regard to the brass floor flange: In New York City we have half a dozen of that type of flanges with graphite gaskets that are made in a V shape, set into V shaped groove in the brass floor flange. This flange is properly soldered to a heavy lead bend, and then the graphite gasket is set into it in a V shaped groove. Then as the bolts are turned down the closet presses on the gasket and it expands, and it makes no difference whether the closet is round or not, that gasket fits tightly on the system in the same way that a rubber plug fits in a soil pipe. It adapts itself to the particular closet, whether its face is round or true or not. Under a test of water pressure I find no trouble whatever with them.

Of course it takes a clever mechanic to set them. That is the great trouble

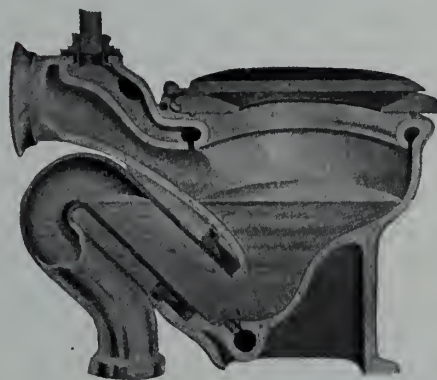


Fig. 2.—Section of Syphon Jet Closet.

with a great many of our connections. If there is a mechanic on the job there is no trouble at all, but if there is a poor mechanic, or a man doing his own plumbing who does not understand anything about it, the best installation in the world is defective. Personally, I know you will have to have this job done by an expert, so that it may be properly soldered in a satisfactory manner, and if you do, you can have a water test or a smoke test, or any other kind of a test applied, and the appliances will be found all tight. There is no question about it; I have seen it every day in the year. The fundamental thing is to get a mechanic.

The Screwed Connection.

Mr. McVea: My idea in bringing up the question of the screw closet was that from practical experience with the screw connection closet, I believe it is an utter impossibility to break it. Every closet is subject to breaking; we all know that. You notice the connection of the male thread on the closet is a very good con-

nection. It is inserted in the closet and the best kind of cement and other substance is used, and it is jointed on the lead bend by a wiped joint. Of course there has got to be great care taken in regard to placing that joint so that the closet will face right and also to make a good job of it, but that is not hard for the ordinary man to do. I believe that is the best connection for a closet.

Mr. Luff: In reference to the device or the connection that Mr. Cotter suggested, bear in mind this. I believe that if you will make an examination in those cities that require brass floor flanges to be soldered to the lead bend, or lead pipe, and the closet connected with it, it is my honest opinion that if these closets were taken down to see if that provision had been lived up to you would find anywhere from 25 to 50 per cent. of those connections minus the brass floor flanges. It is quite a practice with the plumbers to take on a job a few brass floor flanges, and the very fact that he does this ought to put the inspector on his guard as to what is going on. When the plumber scatters a few floor flanges on the floor, it ought to make the inspector believe that he hadn't used any at all throughout the building. If he has, why does he show any over and above what he has used to make those closet connections? Unless you have a provision in your rules and regulations that the floor flanges are to be put on in the presence of the inspector, and he is there to see them set, they may be omitted. Personal watching is about the only reliable method that you can follow to know that the work is as specified.

Now, in reference to the effect of unscrewing a closet of this type from the floor. In the development of all these devices, when defects become apparent they are very speedily remedied. I know as a fact that the member that is connected with the lead bend, in addition to its being soldered to the lead, is used by many manufacturers to be screwed also to the floor, and that member is made with a very heavy thread so that when the two come together, the graphite being used between the two there is no difficulty whatever in taking them apart at any time afterward. That has been my experience for some years now. It is apparent that if you insist on that connection at the floor line which shows on bolts in the closet, there is no method there of connecting the closet to the lead bend except by screwing it on in some such way to have the evidence there that there is a proper connection made, because they cannot fool you on that proposition.

Edward Quinn (St. Louis): Mr. Luff stated that he would like to have the

flanges inserted with an inspector on the ground. In many of our cities you would have to have inspectors on every job. My idea of the siphon jet water closet is that it is one of the best closets made. Also I think there could be some improvement made on the siphon jet floor outlet. For instance, you might have 3 or 4 in. above the floor line, and the brass flange soldered on in such a manner that you could detect it by walking in and finding it at a glance. In lots of cases the brass flanges are as thin as paper. In lots of cases you would have to take the closet bowl out to find whether there was a brass flange. I want to say that you would put an awful lot of work upon yourselves in every large city if you undertook to do anything of this kind.

Charles B. Ball (Chicago): It seems to me this is a very vital point. I think that any one who has had experience at all in inspecting plumbing, especially in careful testing, knows that the floor joint of the closet is the weak place. For a long time I have had a very firm conviction that we must devise a much more economical method of connection. Notwithstanding all that Mr. Cotter has said in favor of the gasket, as he terms it, and the security that it gives, it seems to me that any kind of connection with an unground service of porcelain must necessarily be unsatisfactory. We know that a closet flange is never true and as long as the closet flange is never true you can never bring it to fit a true metal surface. The remedy, in my judgment, in the common types of closets, is to devise a method of grinding by which every closet shall be ground on the bottom, either to a taper, if you prefer that connection, or to an absolutely flat surface. Then it can be applied reasonably close to a metal surface. You can never make a satisfactory job by putting in a $\frac{3}{4}$ -in. screw and having your closet $\frac{1}{4}$ in. higher on one side than the other.

Rigid Connection Versus Lead.

Mr. Luff: I think the question of the utility of the rigid connection as against a connection made with lead enters into this argument very largely. For instance, you cannot overlook the proposition of the settlement of the building or the shrinkage in joists. It occurs to me that in actual practice the final test is made almost immediately upon the finishing of the work, and if you have a rigid connection made in the manner described you have the proposition, after a year or two elapsing, of a settlement or a shrinkage of the joists which will pull the closet away from the floor causing a condition which is very unsanitary, to say the least. You can

imagine that yourself. I believe that the time has come when we should recognize the fact that a rigid connection is not safe; that there must be some provision made whereby that closet settling down on the floor will remain there permanently, because in the use of the building afterward with all kinds of people coming into it, there must of necessity be a very unsanitary condition existing after the settlement or the shrinkage of the joists has pulled the closets away from the floor. In consequence there ought to be a connection in which lead is used—a small portion of lead, at least—sufficient to take up the settlement, the shrinkage of the joists, and allow for the buck-

HANDSOME PLUMBING SHOW-ROOM.

The accompanying picture shows the roomy plumbing shop and display room of James White, junior, at Amherst N.S. The shop was but recently completed in the new Commerce Block in Victoria St. and a glance at it will show that the proprietor believes in maintaining a clean and orderly shop with everything systematically arranged.

Mr. White has been in Amherst about four years and has worked up a very large business. During the past few months he had completed the following contracts: plumbing and heating residences of J. White, H. Pipes, Com-



Attractive Display Room at Amherst, N.S.

ling of the lead, if desired, where the member that is connected to the lead is also screwed to the floor, insuring in every respect a solid, permanent connection at that point to the floor.

Mr. Harbison: How much shrinkage can be depended upon in a 10-lb. lead bend?

Mr. Luff: I should say that if a thoroughly reliable flange were screwed to the floor in a proper manner and soldered to the lead bend there must of necessity be a sufficient length of lead so that when the settlement or shrinkage does take place something will give and it is not going to be the closet. The material that offers the least resistance will be the material that will give. Inevitably, in my mind, that is the lead.

merce Block, T. H. Cochran's drug store, Snot's office, Rhodes, Curry & Co., residence of Eastern Coal Company's manager, A. G. Robb, H. S. Dupuy, factory of F. G. Wheaton Co., warehouse of Amherst Boot & Shoe Co. and a number of smaller contracts of more or less importance.

The General Engineering and Construction Co., Vancouver, has taken out a permit for alterations and additions to Glencoe Lodge in that city at a cost of \$50,000.

Edward Page, Peterboro, has secured the contract for the erection of a new rectory in connection with St. John's Anglican Church. The amount of the contract is estimated at \$7,000.

Back Venting or Non-Syphoning Traps

William A. Ford, Plumbing Inspector, Cambridge, Mass., in Domestic Engineering.

Whether the plumber (particularly of the employing class) has ceased to exert an influence upon public opinion; or whether it be due to the causes more obscure, it must impress many of us that the legislative structure so carefully reared, after years of devotion and laborious effort upon the part of the practical and more advanced men of our class, and in response to a growing public demand for plumbing enactments in the interest of the public health, is in danger of retrogression under the influence of persons of reactionary tendencies, persons, in the majority of cases, having but a quasi connection, if any whatever, with the trade, and possessing but a superficial knowledge of the principles of our craft; although many of these persons are not without a certain degree of general culture and are by no means lacking in a fair measure of knowledge of mechanical, mathematical and scientific laws.

I will exclude for the purposes of this inquiry mere inventors and promoters of non-syphon traps, for their position is frankly and justifiably commercial, although they are, in published advertisements and reading notices, offenders along the lines I am about to indicate.

Activity of Interested Manufacturers.

At a legislative hearing at which plumbing laws in their relation to sanitation are discussed, or before a committee or commission organized for the purpose of creating new or revising old plumbing laws, persons either opposing the perfection of sanitary legislation, or favoring a greater laxity in it; or perhaps some pseudo scientist, who probably combines with his disinterested scientific attitude the more material character of a non-syphon trap inventor, is displaying pernicious activity; and not without indications that his efforts show a tendency at least in the direction of partial success.

While opposition to legislative enactment upon the part of many of these persons is complete to the degree of absoluteness, many of the more important are willing to collaborate along certain lines. But all unite in a grand assault upon that which we term back-air ventilation; all favor either the entire or partial elimination of the air pipe as a method of preserving the water seal of the trap from destruction by atmospheric action, and favor the substitution there-

for of any old trap labelled "anti-syphon."

I think that you will agree that these persons seldom present their views in a very technical or tangible manner, but their appeal is usually to the prejudices, impecuniosity or pecuniary meanness of the lay listener, and that the cornerstone of their argument rests upon the following premise:

Arguments Against Back Venting.

That the application of the air pipe is a crude, elementary and ancient practice of the craft; and, notwithstanding the wonderful advance in mechanical and scientific teaching, and in spite of the demonstration by recognized scientific authority, the plumber, in a spirit of bull-headed conservatism, unintelligence, and pecuniary greed, has remained wedded to his ancient gods and antiquated traditions.

But it is even more intolerable for them to contemplate that by reason of that marvelous craft, cohesion and unity of action associated with the plumber in the lay mind (but of which the plumber himself is so painfully, regretfully and unprofitably unconscious), and in spite of the fact that the public welcomes the new dispensation and is anxious to sit at the feet of the new masters, by a series of web like legal enactments, procured by the plumber, he has compelled the public to submit to his exactions.

Quite a tribute! This ignorant craftsman has really been able to transform our legislatures, city and town governments, into conduits through which flows from the pockets of the people into his capacious maw the wealth in which he so obviously rolls. Well might the people inquire seriously in what school he acquired his peculiar brand of ignorance!

Now, much of our opponents case rests upon the truth of this premise—Is it true or is it not true? If true, the quicker the public emancipates itself the better. We contend that it is not true. The premise is false in the broadest sense of the word, and that I propose to demonstrate if a simple, easily corroborated story of craft history can demonstrate anything. You can accept my "time" at the trade, some twenty-five years in one capacity or another, as a period marking a generation. It is doubtful if the previous generation in its infancy was at all familiar with the

air pipe as known to modern practice. Even as late as the seventies only a very few plumbers of advanced thought employed it, and then it was used in a rather crude and elementary manner.

Experiments of a Generation Ago.

The phenomenon of trap water-seals destroyed by atmospheric action early came under the notice of the old-time plumber. And it probably appeared to him as being a phenomenon, and he, being, perhaps, not much of a scientist but very much of a mechanic (for he was then the shaper and maker of his own materials), began to experiment extensively along purely mechanical lines. So far as possible he discarded the simple form of the "S" trap and boldly started to explore the field of mechanical complications. He deepened the water-seal, he elongated the trap on the horizontal plane, introduced stand-pipes, partitions, valves and mechanical checks. How he revelled in "bag" traps, "P" traps, "D" traps, and other eccentricities taking their name from some remote alphabetical or geometrical resemblance, and he occasionally indulged, when in a spirit of playfulness, in little "phoney" tricks in physics, such as permitting the air to rush in through the inlet, thus venting the trap from the room. I believe some of our modern sanitarians and "anti-back-air-ventilationists" have reincarnated this principle and are "kotowing" before it as a new discovery. And so it went on, each plumber, according to his ingenuity or lack of it, producing his own particular monstrosity, until at last many traps were known to the trade to possess a very fair resisting power under existing conditions.

The plumber had, however, succeeded in developing features worse than the disease, and his nearest approach to an effective non-syphon trap became a veritable stink-pot and a filth retainer. But now that he had produced a trap bad enough to be nearly non-syphonic, he found that with modern construction, the extension of systems, the centralizing of fixtures into groups, and piling one group above another, that even this trap, while retaining all its vicious elements, was ineffective as a non-syphon trap under the great strain to which it was subjected.

System of Air Ventilation.

Under the circumstances the plumber was quite compelled to become scientific.

The craft was well supplied with men well grounded in physics, men thoroughly familiar with the operation of natural laws and laboratory work under fixed conditions, and they began to experiment along practical lines to discover whether these laws would not apply satisfactorily under the more obscure and uncertain conditions associated with a plumbing system. These experiments and actual work were attended with success. Thus the birth, within our own craft lines, within our own time, of the system of air ventilation as applied to traps along the line of known and accepted natural laws.

Of course the system has been frequently negated by improper construction. Vents will clog, pipes are frequently too small, a multiplicity of fittings, angles and turns, and, above all, poor plumbing design, have had their natural effects. But the trend of approved modern practice, particularly as reflected in our up-to-date plumbing laws, has almost reduced this condition to a negligible quantity. And it is precisely this result which has caused the cry of "mad dog" and "robber" to be raised, and which has tempted into the field a horde of inventors whose empirical nostrums differ from each other in neither principle nor merit no more than do the individual peas in a pod.

I have thus briefly tried to touch upon only the preliminary and general grounds occupied by two schools on the question of back-air ventilation. The minority school claims a greater individual importance, a broader culture, greater attainments in the field of science, and claims, rather immodestly, to outbalance the mere preponderance of mediocre numbers; setting up as a premise that back-air ventilation was conceived in ignorance, perpetuated by greed, and buttressed by a stubborn conservatism which refuses fairly to investigate claims of modern mechanical discovery.

The Path of Progress.

On the other hand, the majority school composed of the great body of craftsmen, the employing plumber, formerly a craftsman, and the plumbing inspectors, who, as provided by law, must be craftsmen, maintain that there is nothing new in the modern claims; that they have been compelled to advance from that which is now held to be a modern discovery into a field more in accord with elementary natural law; that the position of the minority school, in so far as it assumes scientific pretension has been debated for twenty years and has failed to convince; that the path of trade progress for a quarter of a century is strewn with the bleached bones of appliances similar to those now urged upon the public by the representatives of the minority school; and, lastly if

the question of pecuniary greed must enter into the question, the onus shall lie rather with the promoter of a proprietary and patented article than upon him who is willing to place at the disposal of the people appliances that have long since become the world's property.

I submit the question in this form, believing that the acceptance of one or the other of these premises cannot fail to have an important bearing upon the broad general question, for I hardly think the lay mind grasps the more technical or specific points in the arguments of either.

If we are holding on with moss-backed tenacity to an exploded principle; if we are kicking against the pricks and stupidly refusing to read the signs of the times; if we are criminally fleeing from the none-too-well-lined pockets of the people; kick us and our system of back-air ventilation unceremoniously out of court as not entitled to respect.

If, however, the present system is a contemporary development; if it repre-

sents an advance from primitive mechanical crudeness along the lines of recognized natural laws; if it is a fact that the plumber has passed through the era of mechanical manipulation to an extent that hardly a feature in the modern non-syphon trap has not been tried by him and found wanting; it must and properly should require a tremendous preponderance of evidence to unhorse the established order. It must rest clearly upon the advocates of the abolition of trap ventilation to prove that either certain natural laws do not exist, that plumbing has returned to such a pristine simplicity that if existing these laws are a negligible quantity, that the relation between plumbing and the public health is either non-existent or greatly exaggerated; or, failing to prove all this, they must stand in the position of dangling a rehabilitated skeleton in the eyes of the public and attempting to pump the breath of life into a moribund and long since forgotten body.

Utility of the Non-Syphon Traps

A. R. McGonegal, in the Plumbers' Trade Journal.

There appears to be a great deal of discussion going on lately regarding the utility of the so-called anti (or non)-syphon trap, and its proper relation to a plumbing system. I have heard and read many discourses both for and against their use, and the recognition that should (or should not) be given them in the plumbing codes. Inasmuch as such discussion is necessarily limited to theory, seasoned with a little experience, and considerable personal conviction I feel that any mite I may add will be in the same category as all that has gone before and much that will come after.

Plumbing Systems and Codes.

It is an accepted mechanical fact that a plumbing system should consist of as few pipes and those with as limited length of run as possible consistent with present ideas of good sanitation. It is also known that a requirement of a plumbing code must be reasonable, in order to stand the test of a trip to court, although there are notable instances of exception to this in the codes of our largest cities, particularly in the matter of materials, under which head traps are necessarily placed.

Let us suppose, for instance, that after exhaustive investigation, a clause should be inserted in a sanitary code allowing the use of non-syphon traps and the consequent omission of the vent connections; and that such clause specified cer-

tain types and forms (as it would have to do), as well as a certain kind and quality of material to be used in the construction of it. Would it not be treading closely on the limit of reasonableness to limit closely form and material, as well as tending to throw the business of furnishing such traps into the hands of a few makers simply because some of the essential points may be under patent? Would it not also put in the hands of a crooked inspector (if there are any) a chance to "approve" a more or less objectionable trap for a consideration? To my knowledge, there are only two traps which have passed disinterested tests in which the various sanitary essentials for a trap of this character were considered, and both of them have their main points amply covered by patent-right.

Arguments for Non-Syphon Traps.

The main reasons for allowing a non-syphon trap are: Low cost of original instalation, ease and low cost of installing on old systems, lesser rate of evaporation of seal, fewer joints in piping system, and occasional stoppage of back vents due to carelessness, collection of grease on account of partially obstructed wastes, rust and scale formation, hoar frost, etc.; and I believe that these are all amply answered in paragraphs which follow:

Carelessness would probably develop troubles in connection with non-syphon

trap systems, fully as bad as we have with vented systems. Properly placed and designed grease traps and proper size waste lines will be used on one system as well as the other; and a minimum size of 4-inch in cold parts of the country through the roof would do away with hoar frost troubles, if they are really as bad as we are led to believe.

Ventilation Should Be Direct.

In a properly designed system the fixture traps should be largely a second line of defense. The system should be so laid out that the ventilation should be direct and complete, and the current positive. Every possible foot of sewer soil and waste should be traversed by the air currents which are necessary to the life and work of the bacteria engaged in keeping the pipes clean and free of adhering particles of animal and vegetable matter. This design necessarily means the complete adoption of the continuous and circuit vents, straight stack lines no offsets, omission of main trap, shortest possible fixture connections (to wall where possible) and many other points that are new to the average architect and designer and are little understood by them. On such a system it should make little or no difference if a trap should become unsealed temporarily, the current of air passing by the easiest route to the outer air and ignoring the trap with its horizontal connection and drop entirely.

The run of waste pipe from a non-syphoning trap located ten or twelve feet from a ventilating point would of necessity be foul and would require more safeguard in the matter of length of time required for seal evaporation than has been claimed for it, whereas a syphoning trap located within twelve diameters of its horizontal waste pipe of a vertical stack which has more area than all the fixtures which might reasonably be expected to discharge through it at one time would be perfectly safe to my mind, without any back vent connection at all.

In addition it cannot be said of the non-syphon trap, that it is any more secure against unsealing by capillary attraction, or that it is in itself as cleanly (self-scouring) as the syphon trap.

Bad Effects of Competition.

There is one so-called non-syphon trap on the market that some years ago made a remarkable record in a series of tests, but the maker in order to compete to better advantage with other manufacturers, cut a few cents worth of material out of his trap, and as a non-syphon trap, it is now useless. This is not only a fact with regard to traps but with practically all other material. For instance, the majority of 4-inch E H cast iron pipe averages 11 and 11½ pounds per foot instead of 13 pounds. Copper-

lined tanks are "oreide" and other compositions. The average "competition" brass tubing and traps, to use the words of a plumber "you can almost blow through." Brass is getting yellower (or whiter) every year, lead is more lifeless, and "half and half" comes farther away from being "almost."

Now, if we open up for non-syphon traps, will it not be probable that the process of cutting down and cheapening will finally give us a non-syphon trap with just the number of good points or the ½ S with as many or more bad points, and one that is just as syphonable in addition.

In passing on the admissibility of such traps it would be well to bear in mind that the tendency would be to limit the make to patented traps, because it is not practicable for every individual trap "to be measured inside and out by the inspector" and also the opening it would afford for a manufacturer to purchase the approval of his trap from an unscrupulous inspector.

Government Should Test Apparatus.

I believe it would be well for some disinterested society or the government at its bureau of standards, to undertake a thorough investigation of the various systems of plumbing work, under every conceivable condition that might arise. Such an investigation should be conducted without recourse to any manufacturer and should be sufficiently exhaustive to establish without a reasonable doubt, the superiority of either one or the other of the systems.

In all such investigations in the past, either the manufacturer has furnished the apparatus or the money, and in some instances made the tests in his own shops, or the test has been held with an arbitrarily designed apparatus bearing little or no relation to actual conditions and in no case has more than one type of construction been tested and comparisons were impossible.

NEW NYE TYPE VISE.

One of the manufacturing concerns in this country making devices for plumbing and steamfitting uses which has met with great success and has made a great name for itself, is the Nye Tool & Machine Works, of Chicago. The aggressiveness of this concern from a selling standpoint is very well known to the trade generally, and Nye's unique selling methods have long been the talk of the trade.

One of the latest products of this concern is the Nye pipe vise. This vise is much smaller than other vices. It also weighs less, which is an item of no small consequence. In addition to this it is easily and quickly attached to any solid body, a post, bench, or wagon bed. Where one

is obliged to work in cramped quarters, this is claimed to be an ideal little bit of mechanism. Another of its many features is its wide open frame, having no hinge, permitting one to easily and quickly insert the pipe. A piece of pipe can be put in, or taken out of a Nye vise in far less time than any other make known, it is claimed.

The lower jaw is a solid "V" jaw, and made of the best tool steel properly hardened. The extraordinary and new feature of the vise is found in the upper jaw, which is a swivel type. The result of this swivel action on the part of the upper jaw is two-fold. First of all, it takes only one-twelfth the pressure to get a solid grip. With a five-pound pull on the set screw governing the swivel jaw you get a pressure equal to 60 pounds under the old style vise. On top of this it appears that the harder or greater you pull on the pipe, the tighter the grip of the swivel. The slight play allowed by the swivel always adjusts it to that position on the pipe where the grip is absolute and positive, and without the slightest possibility of injury to the pipe.

When the upper jaw becomes a trifle dulled, it is easily sharpened and made good as new. In every way the Nye vise presents an unusually attractive appearance, and from a manufacturing standpoint should prove a decided success.

More complete details, prices, etc., may be obtained from the Nye Tool & Machine Works, 15-19 South Jefferson Street, Chicago, Ill.

ONCE WAS ENOUGH.

A. J. Hammond, a Winnipeg master plumber, recently took a trip to California. One day as he was being driven in a stage coach along a narrow path high up on the hill and being a little nervous at the proximity of the stage coach to the brink of the ravine, he inquired of the stage driver: "Do people fall over here very often?"

A broad grin spread over the driver's face as he rolled his wad of tobacco from one cheek to the other, and looking up at the plumber with a twinkle in his eye, he exclaimed: "Naw, only once."

Tenders have recently been received for a four-storey business building, to be erected for the Argyle Buildings, Limited, Winnipeg.

Buildings valued at \$25,000 will be erected at Elgin, Man., this summer. This is double the value of structures put up last year.

St. Michael's Church, \$5,000; J. A. Chisholm, residence, \$2,000; and W. J. Heming, residence, \$2,400, are new building permits recently granted at Vancouver.

Cost of Cooking by Electricity

Thorough Investigation Proves it to be More Expensive Than Other Fuels.

A series of experiments in electrical heating and cooking have been carried out in the Home Economics laboratory of the Philadelphia School of Technology, by Miss Charlotte D. Seaver. Although Prof. John P. Jackson some years ago made investigations as to cost of cooking by electricity, he did not measure or weigh the foods cooked and took no account of the time required for getting the temperature up to that required for effective cooking; while comparisons of relative costs were made only with coal. Miss Seaver's experiments covered all these points, comparisons being made with coal, gas, gasoline and kerosene ranges, while several different makes of cooking apparatus were used. Her investigations were made by first cooking certain specific articles of food and then complete meals, consisting of a breakfast, luncheon and dinner. She summarizes the results of her experiments as follows:

At the rate of four cents per kilowatt-hour, cooking by electricity would cost double that done by gas fuel; and, at the prices ordinarily paid for electricity it would cost at least six times that of gas or coal, which are the fuels most commonly used. This fact, together with the initial cost of the apparatus required, would appear to forestall its general adoption at present.

The comparative cost of cooking with various fuels, for the same kind and character of cooking operation, the time in each case being based on one hour, is given in the table below:

Source of Heat for Cooking.	Electricity.	Coal.	Gas.	Gasolene	Kerosene
Amount of energy or fuel required for given cooking operations . . .	1,032 kw-hr.	10.5 lbs.	20 cu. ft.	.0833 gal.	.078 gal.
Cost (assumed) . . .	\$0.04 per kw-hr.	\$7.00 per ton.	\$1.00 per 1,000 cu. ft.	\$0.15 per gal.	\$0.14 per gal.
Cost of cooking by given source	\$0.0413	\$0.0387	\$0.02	\$0.0124	\$0.0109

On the other hand¹ a recent issue of the Electrical World presents the case for electrical cooking apparatus in a somewhat less unfavorable light. It says:

Great Advance Made by Gas.

"The cost of cooking by electricity depends, of course, upon the cost of the electrical energy to the consumer. Many, however, are satisfied to dismiss the question of cooking by electricity from their minds with the thought or statement that it would be impossible for electricity, generated, as in most cases it is, from the energy stored in the coal, through the round about means of the steam boiler, steam engine, dynamo and transmission wires, to compete upon a cost basis, with the direct use of coal for cooking purposes.

"Those who argue upon this basis lose sight of the great advance which

has been made by gas, also a product of coal, in this field where it very frequently is able to show a decided saving as compared with the direct use of coal for the same purposes. The reason for this is found in the efficiency which may be obtained in the various sources of heat.

"While the cost of one heat unit delivered in the form of artificial gas must, of necessity, be considerably greater than that of an equivalent amount of energy delivered as coal, the greater saving brought about by the more direct application of the heat possible with the gas flame, and the possibility of entirely shutting off the supply of gas at all times when heat is not needed, in many cases enables the gas-heated apparatus to show a saving in cost of fuel when compared with those deriving their heat from the direct consumption of coal.

"The same is true with the use of electrical energy, only to an even greater degree. The ease with which the electric current may be switched on or off and controlled is even greater than that pertaining to the use of gas as a source of heat and the efficiency of heat transmission to the body to be heated is far greater. The efficiency of heat transmission with the ordinary gas range is placed by those who have made a study of this subject at about fifteen per cent. while the various high grade electrical cooking devices now obtainable show an average efficiency of heat transmission of about seventy per cent. or better.

"Electric lighting companies generally are only just beginning to realize the possibilities in this line and to make systematic efforts to obtain this class of business. It would seem that this class of load, coming as it generally would at a time when the station load is small and seldom if ever overlapping the peak load, would be particularly desirable, as it would add to the day and summer load without necessitating any additional investment in copper or power plant apparatus. In order to obtain any great amount of it, however, it would be necessary for the lighting companies to compete with gas at one dollar to one dollar and a quarter per thousand and the rate should not exceed three cents per kilowatt-hour.

"This is a low rate, but any considerable quantity of this desirable class of business cannot be obtained at higher rates, and under the circumstances even

this rate should show a reasonable profit for the lighting company.

"This would seem evident when it is remembered that one of the chief reasons why it is necessary to charge the small residential consumer so high a rate for his energy is because his monthly bill is so small a percentage of the cost of power plant apparatus and line-wire which must be installed and maintained in order to supply his demands. If, then, his monthly consumption can be increased some three or four times without necessitating any increased expenditure for apparatus and line-wire would it not be good policy to increase the output and revenue of the plant by giving the customer the advantage gained by the lighting company due to the increased load factor? But even at somewhat greater cost of operation, electric cooking has many advantages which appeal to those who can afford to pay for them, just as there is in the field of artificial lighting.

"If the electric light had no other argument to offer in favor of its use than its cost as compared with other forms of illuminants its progress would have been slow. In spite of this, however, it has come and is rapidly crowding all other forms out of the field. The reason for this is to be found in its many inherent advantages which have in most cases out-weighed the cost of operation, which is usually found to prevail when compared with other forms of artificial light. The same is true of electrical cooking."

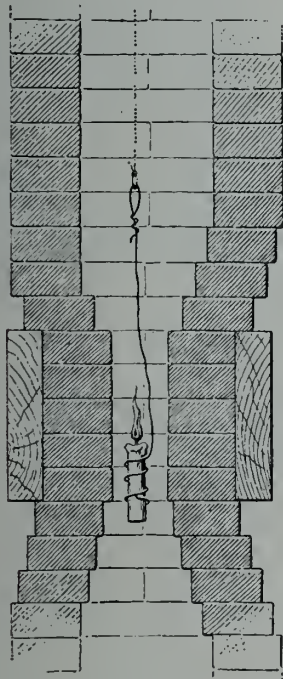
ELECTRIC HEATING BECOMING POPULAR.

The progress of electric heating is no longer held back through prejudices. During the last twelve months purchases of electric heating appliances have been made to the amount of between \$500,000 and \$600,000.

Apartment houses are being constructed with kitchens designed for electric cooking only, regulations permitting no other method. The dining-room in the electric home is equipped with chafing dish and coffee-percolator in addition to the complete outfit in the kitchen for cooking food. People are buying electric air radiators for heating the rooms when it is not exigent to start their furnaces. Electrically-heated carpets and rugs have found favor in that they distribute the heat uniformly over the surface of the floor, keeping the feet warm and the head cool. The electrotherm has finally substituted the heavy and inefficient hot water bag in the hospital and home. The thermophile bed covering for sleeping in cold rooms has proved the acme of hygiene. Thousands of ladies are enjoying the convenient and cleanly appliances for heating their curling irons, and mothers are appreciating the new baby milk warmers and the electric heating bath, and the one million electric smoothing irons in use to-day are reducing the labor of ironing to a minimum and at a cost not exceeding the old methods.

Locating Flue Troubles

Heating contractors, and in fact, all who sell apparatus which burns fuel of any kind, can save a lot of money by knowing something about flues. Theoretical knowledge as to what flue construction ought to be is not difficult to get, but the vagaries of the builders of flues and the flues as they exist or the departure in their construction from well-known correct rules are the cause of troubles which can be located only by an investigation. By this, writes G. G., in the Metal Worker, I do not mean standing on the outside of a house and looking at the chimney or standing in the cellar or some other part of the house and looking on the outside of it. When the fire in a furnace, steam boiler or hot water heater burns slowly and never shows a briskness, and the ap-



Method of Locating Flue Troubles.

paratus fails to develop its heating capacity, it is useless to look to the size of the pipes, the sizes of the registers or radiators, or make calculations to find if the house has a big enough heater. With the fire in a dull condition the chimney is the offender every time.

Now the question is to locate the defect which is causing the trouble. There are different methods, but one of the best is to take a few feet of wire and put it around a candle securely and attach to the wire a stout string—the wire prevents burning the string. Then lower the candle down the flue, observing the size and shape of the flue by the light of the candle as it passes down. Such a method of investigation will show any projection into the flue, any offsets or any reduction. Apparently the mason who builds the flue has no

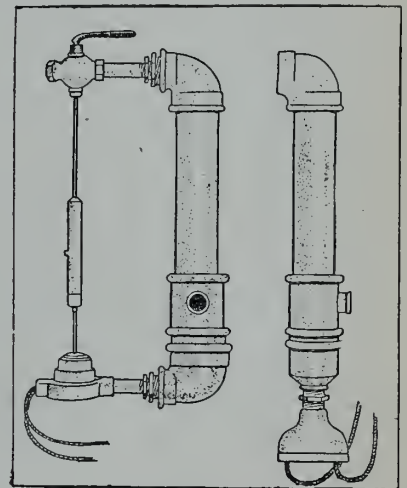
hesitation whatever to reduce its internal area to suit his convenience in passing between joists or for any reason. He will follow the plan which is easiest for him regardless of consequences, and in a fine building which is provided with a large flue for running a big heating apparatus it has been frequently discovered that the mason has reduced the flue more than half in area and changed the shape so as to offer a most positive impediment to the passage of air currents through it. In such cases by measuring the length of the string to the candle and then measuring down from the top of the chimney in the building the location of the offending defect can be correctly ascertained. Then whatever derangement of decoration or furniture it may entail the flue must be cut into and such changes made in its construction as will permit the heating apparatus to operate. When work of this kind is done the heating man should assume the position of doing a favor to the house-owner rather than that he is doing a part of his work in finding the trouble with which he has nothing to do and which is making him unnecessary labor and expense.

It may be difficult to get to the top of some chimneys to conduct an investigation as suggested, and there is no objection if some other plan is tried, but in my experience this is the most certain way to get at the truth of the internal condition, size, shape and course of the flue. In some instances apparently there has been no good cause for drawing in a flue and it has been necessary to cut into the breast which was wide enough to permit a flue of ample dimensions and then to cut out some of the brick work to get a flue of sufficient size and leave a smooth flue for future service. Sometimes by the use of a mirror held into an opening in the bottom of the chimney the conditions can be discovered and it is easier to do this than it is to climb to the top of the chimney. But if information cannot be secured from the bottom of the chimney the top is the next step, and by measuring the length of the string to the candle the point of trouble in the flue can very correctly be determined by measuring the same distance down from the top of the chimney. I would impress upon all men who are doing heating work the necessity of having a good flue, and wherever the fire smoulders and burns slowly without briskness and brightness it is not the apparatus that is to blame but the man who owns the house has before him the problem of making his chimney as it should be to enable the heater to work. It is his job to stop choking the heater, which is in very much the same condition as a man with somebody's hand on his throat choking him. He may exist under very difficult and disagreeable conditions for a time

but when the hand is removed he will be better and so will the heater when obstructions are removed from the flue.

AN ELECTRIC WATER HEATER.

Among the various electrical cooking devices and household cleaning apparatus there seems to be one thing that has been overlooked, says Popular Mechanics. The heating of water for the lavatory or bath has either been accomplished with the aid of a gas heater or the kitchen range. A simple device as shown in the accompanying illustration shows a bath and lavatory instantaneous electric water heater constructed by using ordinary pipe and fittings in which are two electrodes. The cold water enters the heater at the bottom, is heated by the electrodes while flowing through, and comes out of the faucet connected with the top of the heater at any temperature desired, the degree



Electric Water Heater.

of heat being regulated by the flow of water. A cup of steaming hot water can be quickly drawn. The water heater has an electric switch attachment that turns on both the electric current and the flow of water at the same time. The one constructed for the bath is connected to a switch conveniently located and the flow of water regulated by the ordinary faucet.

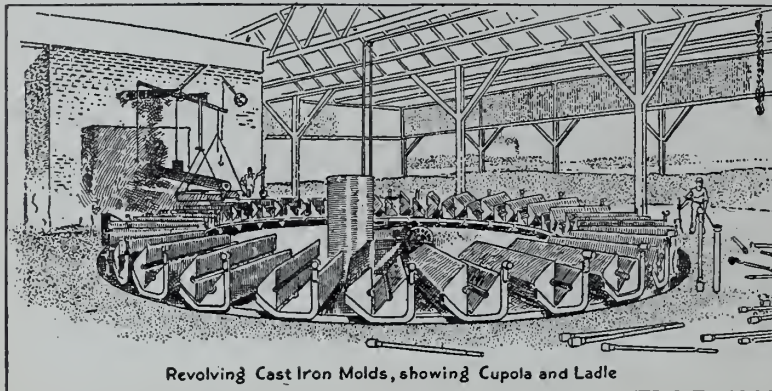
CIRCULATION OF COOLED DRINKING WATER.

The supply of ice cold drinking water to every guest room in the New Southern Hotel of Chicago will be done economically by means of continuous circulation and iced water through supply pipes. The water is filtered and cooled, then circulated by means of rotary pump. The supply pipe runs directly back of the faucets, so that in drawing the water, not a thimbleful is wasted before the coldest water is delivered. The force needed is not great, because the return flow is by gravity.

Casting Pipe in Permanent Molds

It has long been the dream of every foundryman whose trade requires a large number of duplicate castings to make these castings in molds that would

on the table. Projecting from the top of the cylinders is an inclined plane surface designed to lift the pins in the trucks when the cylinders move in a

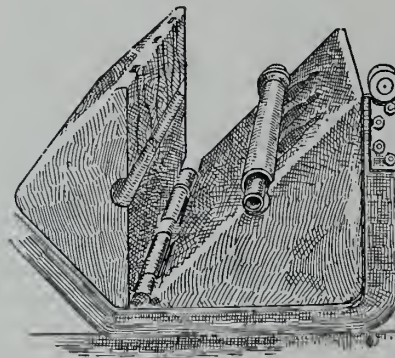


Revolving Cast Iron Molds, showing Cupola and Ladle

not only survive the process but would also produce castings that would be marketable and could be easily machined. This dream, as far as the casting of water and gas pipe is concerned, has been realized, according to Popular Mechanics.

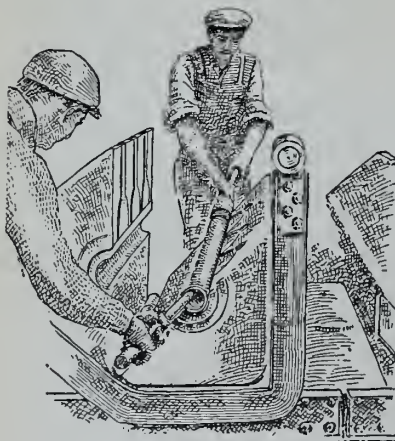
The machine by which it is accomplished consists of a table or ring approximately 40 feet inside diameter, carrying 30 molds, arranged at equal intervals. The table is constructed of two concentric rings of channel beams, connected with 32 cross-pieces or trucks, each of which has two wheels which run on concentric circular tracks set in concrete foundations. Under the table or ring, at two diametri-

direction opposite to the required motion of the table and to allow a pin at each side to fall after the inclined surface has passed. In this manner each



Open Mold, Showing Finished Pipe.

cycle of the cylinders intermittently moves the table ahead a distance equal to the spacing of the molds. The table makes one complete revolution every 7½ minutes, producing 30 pipes in that time or 240 pipes an hour.

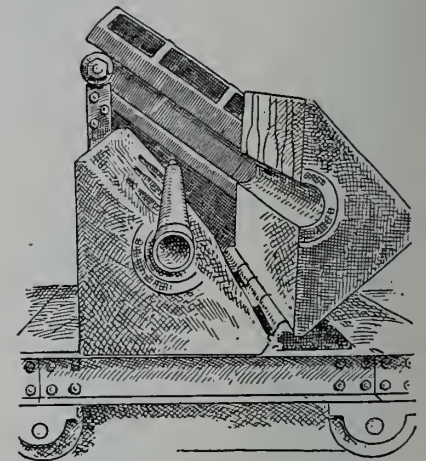


Setting Core.

cally opposite points, are arranged two hydraulic cylinders, which slide in ways similar to a planing table, the pistons within the cylinder being held stationary and the cylinder being moved back and forth by the operation of a four-way valve controlling the admission of water alternately to each end of the cylinders. The stroke of the cylinders is of such length as to be slightly more than the spacing of the molds carried

high and 6 ft. long, parted on a diagonal line across the corners, and provided with hinges at the lower edges of the parting, so as to allow the upper portion or core to be swung up and back from the lower portion or drag. The molds each weigh 6,500 lbs. complete. At the centre of each mold is the cavity in which the metal is poured to form the pipe.

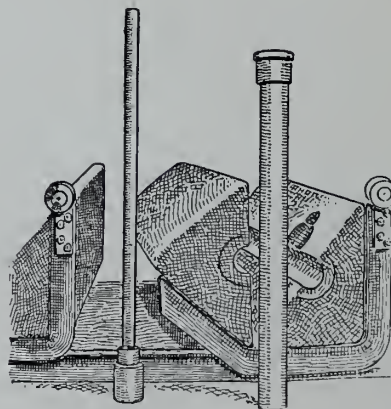
Each end of the mold is provided with rings or bushings, which are used to support the core arbor in an exact central position in the cavity of the mold, so that the pipe when finished shall have uniform thickness of metal



Mold Entering Closing Device.

at every point. This core arbor consists of a hollow cast iron cylinder somewhat longer than the pipe to be cast and three-quarters of an inch less in diameter than the inside diameter of the pipe.

The core is made by placing the core arbor in a machine which consists of a semi-circular support for the ends of the arbor, a shaking screen arranged to sift sand a guide to drop it upon the arbor, and a knife. The arbor is wet thoroughly and rotated while the sand falls and clings to it. The surplus sand is scraped away by the knife, placed at the proper distance from the arbor to make the finished core of the diameter and shape required, and it is ready for use.



Finished Pipe and Core Arbor Mold Open.

Each mold consists of a rectangular block of cast-iron 18 in. wide by 18 in.

A freezing apparatus, consisting of a double wall tin vessel with a capacity of 5 gallons or more, is reported by Consul Robert J. Thompson, Hanover, Germany. There is a hollow space between the two walls—that is, between the inner and outer vessels. This space completely surrounds the inner compartment and is about an inch in width. By the graduated admission of carbonic acid to this surrounding chamber at the bottom of the vessel, and from this surrounding chamber into the vessel pro-

CLEANING CEMENT FROM TILE.

Cement is a silicate of lime, and as such is far too hard to remove by ordinary scouring with sharp sand or other gritty material. Consequently after a tiled floor or wall has been grouted, and it is necessary to remove the superfluous cement from the surface the wall or floor is washed with muriatic acid. This acid is a volatile gas dissolved in water. It attacks the cement and forms a soluble lime salt, which can be readily removed by washing with ordinary water, writes C. J. Fox.

Muriatic acid, however, casts off fumes which in physical laboratories, fine dynamo rooms or other places containing delicate metal instruments, such as galvano-meters, ohmmeters, etc., injures the metal by corrosion. In these places dilute sulphuric acid may be used. It is not volatile and consequently does not injure metal work. However, it does not form with the cement a soluble lime salt, but a phosphate of lime, which is the same as plaster of paris. This is much softer than the original Portland cement, so that by using dilute sulphuric acid and scouring hard with sand it is in most cases possible to clean the tile floor or wall.

The best medium for dissolving cement is citric acid. This is a clear, solid substance which can be bought from any druggist. It dissolves readily in water and will attack set Portland cement quite as well as will muriatic acid, because it forms with the cement a perfectly soluble nitrate of lime. Its only objectionable feature is its cost, which is several times greater than that of muriatic acid. Ordinary lemon juice is a solution of citric acid, but as the latter is made in a wholesale way in the tropics it is cheaper than lemon juice.

A cheaper substitute for citric acid is tartaric acid, much used in making lemonade. This also can be obtained at any drug store. It forms with the cement a tartrate of lime. It is not as soluble as citrate of lime, and, consequently, its use in cleaning tiled floors has disadvantages similar to those met with in using sulphuric acid. The tartrate of lime is, however, somewhat easier to remove than sulphate of lime. Consequently, although a tile surface which has been treated with tartaric acid requires considerable sand scouring to remove the cement, the operation is nevertheless easier than when sulphuric acid has been used.

Muriatic acid is the most usual and most feasible medium for cleaning cement from tile floors. When, however, its fumes are likely to corrode delicate metal instruments, either sulphuric, citric or tartaric acid must be used in its place. The citric acid is the most effective. Sulphuric and tartaric acid change the cement into sulphate or tartrate of lime, which requires considerable scour-

ing with hard, sharp sand, but is, nevertheless, far softer and more easily removed than silicate of lime, which is the original form of the cement.

SEEING FORT WILLIAM.

According to press reports it has been pretty hard to see Fort William recently on account of heavy smoke from forest fires, but the accompanying picture indicates that the city can still be seen under certain circumstances. In the auto are Allan Cameron (honor graduate Plumbers' Trade School, New York), and Ed. Higginbotham, two successful Fort William plumbers; sitting behind, Mike Sullivan, salesman for the Canadian Brass Manufacturing Company, who is steering the wagon. Beside Mr. Sullivan is W.



Fort William Plumbers Ready to Put Down Fire (Water) in the Jungle Where Smoke From Forest Fires Makes Men Thirsty.

J. Huston, contractor, and standing in the background is J. Cofreth, a dry goods man, who is a good judge of wet goods.

Any master plumbers who visit Fort William will be shown Fort William by Messrs. Cameron and Higginbotham if they are readers of The Plumber and Steamfitter.

SUN MOTOR.

More than twenty years ago Ericsson showed, by experiment, that a mirror with an area of 100 square feet could heat the boiler of an engine, and thus develop about 1 h.p. for some ten hours a day. Many readers will remember the story of how Archimedes burnt up a hostile fleet by using mirrors and the rays of the sun. The ingenious American, who carries mechanics on to the farm, has built already a sun-motor which has

been used for irrigation in one of the Western States. The cost of fuel is nothing, but there is the capital expenditure on mirrors, boilers, and steam-engine. Can we argue that, as the fuel supply decreases and becomes dearer, the population will drift to the more tropical regions where power will be available from the sun? For it is impossible to imagine that large cities such as London and New York could remain tenable without a fuel supply. And, therefore, the project which is being undertaken at the mouth of the Elbe, where the tides are to be the source of motive power for a new electrical station, will be of great importance. On paper, the financial prospects seem good; but we must wait for the result of the year's trial.

CONDUCTOR WOULDN'T WAIT.

During the National Plumbers' Convention at Montreal a trig little woman with a horticultural display on her head stepped upon the pay-right-now-while-we've-got-you car and the conductor held out his farebox.

"You'll have to wait until I get inside," she told him.

"Oh, no," insisted the faretaker, "you have to pay right here on these cars."

"But I tell you I can't pay you until after I get inside," repeated the little woman.

"Yes, but——"

"Here" interrupted John A. Gordon, the new National President, who had climbed on behind the woman. "Just take her fare out of this. I know how it is. My wife carries her money that way."

NEWS OF THE TRADE IN CANADA

A. Small, plumber, Montreal, has been registered.

Galarneau & Vezina, plumbers, Montreal, have dissolved.

Charbonneau & Genest, plumbers, Montreal, have dissolved.

The Royal Electric & Gas Supply Co., Montreal, has been registered.

Brown & Semple, Brockville, are doing the plumbing in the isolation hospital at that town.

The estate of James Greenaway, plumber, London, has sold the business to F. J. Greenaway.

A. W. Gardiner, master plumber Westmount, Que., with Mrs. Gardiner was a visitor in Toronto, recently.

The Hick Hardware Co., Lethbridge, has the contract for heating and plumbing in the new fire hall at that place.

For the supply of pipe required by the City of Winnipeg, Dunn Bros. were the successful tenderers at 7.99 cents a foot.

J. E. Farrell, master plumber, North Bay, is visiting Toronto treating his eyes, which have been bothering him considerably lately.

Chas. Goodyear, electrical supplies, Winnipeg, has taken E. H. Smith into partnership. The style of the concern will now be the Goodyear Electric Co.

W. H. Dance and wife, Montreal, visited Toronto a fortnight ago and Mr. Dance renewed acquaintanceship with many fellow plumbers and supply men.

Brickman & Baker, Stratford, have disposed of their cigar and tobacco business and will hereafter devote all of their store space to their plumbing and hardware business.

The annual meeting of the Chatham Gas & Electric Light Company, was held last week, very satisfactory reports being presented. A dividend of 6 per cent. was declared.

A. S. Lamond, of the Wolverine Brass Works, Chatham, returned last week from the annual outing given by Cornelius Bros., at Lewell, Mich., to members of their Grand Rapids and Chatham office staffs.

J. S. Glennister, of the Dominion Radiator Company, Toronto, was in Chatham in consultation with Architect Arnold in connection with the heating system to be installed shortly in the new Wallaceburg convent.

Stevenson & Malcolm, plumbers, steamfitters and electricians, Guelph, have secured the contract for the installation of a heating plant in the City Hall

at that place. The contract price was in the neighborhood of \$2,000.

Elford & Cornish, Saskatoon, have been awarded the contract for plumbing and installing a furnace in the new house being erected by H. W. Way at that place. Hutcheon & Shackleton are putting in the electric fixtures.

The Glace Bay (N.S.) Town Council has passed a by-law requiring that all electric wiring be done by certified and competent persons, and to be inspected by the town's electrical superintendent, or otherwise connection will be refused.

Among the interesting and instructive displays at the Central Fair, Ottawa, was a display by Currie & Levack, of Safford water heaters and radiators, also a plumbing exhibit wherein were two bathrooms exquisitely fitted up with all modern and sanitary equipments.

The Monarch Brass Works, at Port Colborne, were totally destroyed by fire recently. About 9.30 p.m. fire was noticed in the molding room. There was not a drop of water to hand, the Port Colborne waterworks engine being disabled. The brass works employed about fifty men.

With liabilities totalling \$44,463, Philip Lahee, electrical contractor, Montreal, has agreed to make an assignment on the demand of the Wire & Cable Company, whose claims amount to \$26,228. Other principal creditors are the Conduit Company, \$9,419; John Forman, \$307; Hart Manufacturing Company, Hartford, \$998.

Natural gas was turned on at Wallaceburg for the first time a week ago, and is now being used in the glass and sugar factories. The town is being rapidly piped for residential patrons. Geo. B. Woodard has opened a gas supply store on James Street, and is after a share of the resultant business, having already secured among others the contract for installing gas fixtures in the Hotel Empire.

The Board of Control of the City of Winnipeg, has placed an order with T. McAvity & Sons, of St. John, for 500 6-inch, 100 8-inch, 12 10-inch and 14 12-inch McAvity iron body gate valves, with bronze settings. This firm have now furnished to the City of Winnipeg alone, more than 1,000 lunge valves and have also just supplied the City of Prince Albert with a complete equipment of valves, hydrants and World brand corporation brass work.

A. Lapointe, a plumber of Limoilou, Que., had the thrilling experience of being buried alive lately, and, as a consequence, he now lies a patient in the Hotel Dieu Hospital, Montreal. A water

pipe being broken an excavation of some ten feet in depth was made in order to repair it, and Mr. Lapointe got into the hole for that purpose. While he was working at the pipe the ground above him suddenly gave away, and before he could make his escape or realize what had happened he was overwhelmed by the earth and almost twenty minutes elapsed before he was extricated from his dangerous position. The ambulance was immediately summoned and the injured man was taken to the hospital, where he has since undergone an operation, being internally injured.

A new steam heating plant has been installed in the Sarnia Collegiate Institute, at an expense of \$4,532, and the building now has a heating and ventilating system that is not surpassed in Ontario. The work was done by the Purdy-Mansell Co., of Toronto, and is known as direct-indirect radiation. Cold air is taken from the outside and passes through a warm radiator as it enters the room. The cold air is drawn off the floor and carried through registers up chimney flues and escapes. The upward draft of cold air is accomplished by heating the upper part of the flues. Pure air and a steady heat are secured by this system. The boiler has capacity to heat four more rooms than there are at present. It is 5 feet by 14 feet and has 78 three-inch flues. It is estimated that the saving in coal will more than pay the interest on the new system.

PLUMBING IN ST. CATHARINES' SCHOOLS.

Most plumbers have heard of the lightweight boxer, Riddell of St. Catharines, who cleaned up everything in his class



ANDREW RIDDELL Jr. St. Catharines
A Successful Young Plumber Who Has
Completed Some Large School Jobs.

at a recent boxing tournament at Toronto. He is a namesake of A. Riddell, jr. who cleans up many good plumbing

contracts at St. Catharines, and whose picture is shown herewith.

One of the recent jobs Mr. Riddell completed was the installation of Standard Ideal range closets, lavatories, drinking fountains and urinals in two St. Catharines schools, and members of the School Board are so satisfied that they have expressed their intention of having the same work done in three more schools.

Pumps for liquids should be constructed from materials which are not attacked by the liquids elevated. The following, according to "Die Fordertechnik," are the best materials for the liquids mentioned: Cast iron: Ammonia, tar, mineral oils. Gun metal: Vegetable oils, salt water, molasses, beer, lime, water, weak acetic acid. Lead: Strong acetic acid. Lead (with a small amount of tin and antimony): Hydrochloric and sulphuric acids. Glass: Strong acids, alkaline liquids. Earthenware and gutta percha: Strong acids.

GOOD MARKSMANSHIP.

Wm. Linton, the popular representative of the Standard Ideal Manufacturing Company Port Hope, has won a reputation as a good shot, and many of his friends have enjoyed a juicy steak of deer or bear meat, or a taste of partridge brought down by his rifle.

Last week Mr. Linton was at Niagara Falls, and, not having his gun with him, he used a camera with Joe Henderson, the big-bodied and large-hearted plumber as his target, with the plumbing shop in the shadow behind.



J. T. HENDERSON, NIAGARA FALLS

Mr. Henderson reports business good, he having just completed the installation of Standard Ideal closet ranges, urinals, drinking fountains, etc., in two Public Schools at the Falls.

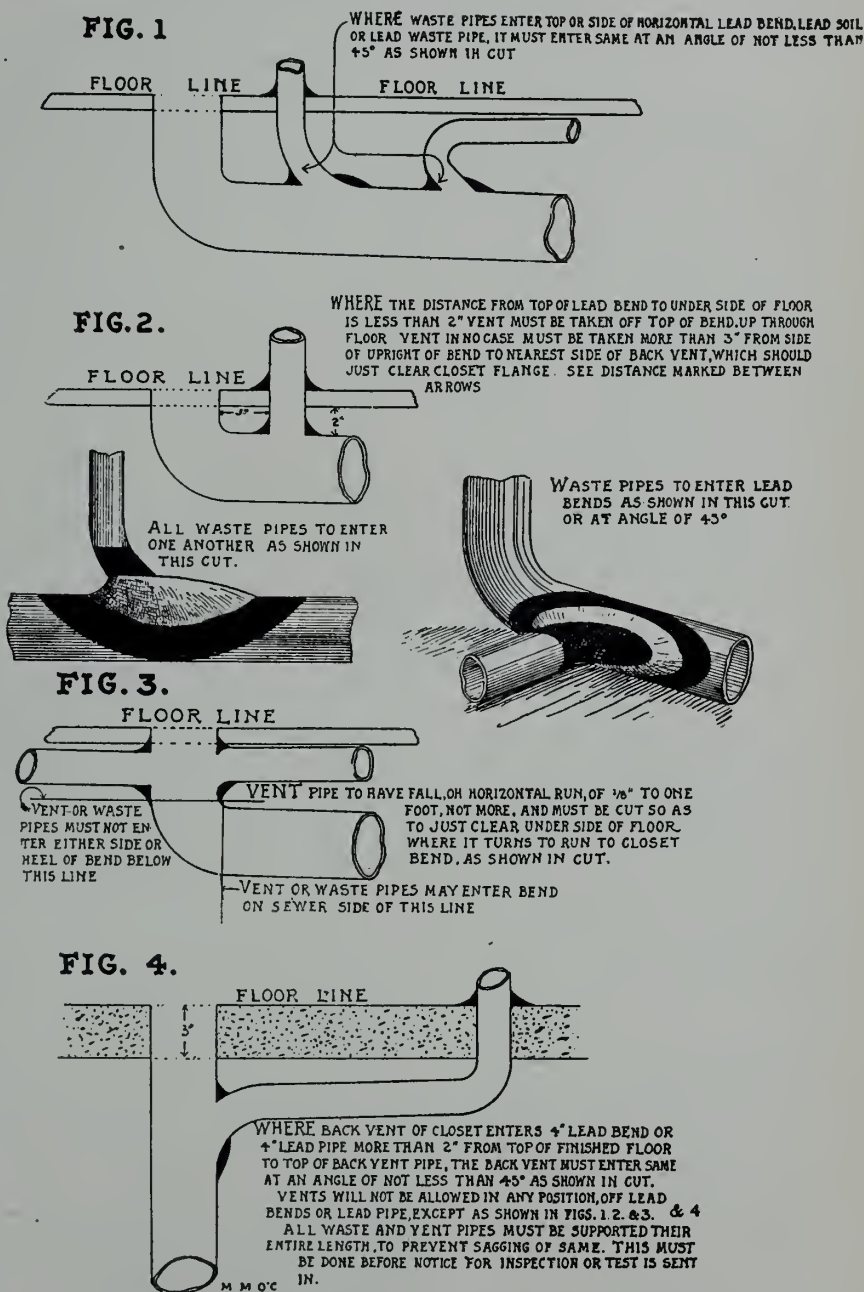
BOILER TROUBLES.

Among boiler troubles, that of leaking tubes is, perhaps, the most common. As a rule, this is due to scale collecting around the tubes on the rear head and it is almost impossible to remove it from around the centre tubes, as they cannot be reached for efficient work with a scraper. The vertical spaces can, however, be cleaned fairly well by the persistent use of a long chisel-ended bar. A man should go inside and lie on the top of the tubes, facing the rear, and scrape the head.

Care must be used, if the bar is rather

sharp, not to injure the tubes. If this is done and the tubes re-rolled and re-beaded, they can be made tight, and the rest of the scale will gradually work off if the vertical spaces are kept clean and a good scale solvent is used. If the head is heavily coated with scale, there is little use in trying to keep the tubes tight after they once begin to leak, especially if the boiler is forced at all. A great many tubes are put in without beading over the rear ends. This is a mistake, as the flames striking these thin ends soon burn them, making them brittle and destroying their holding power.

OTTAWA PLUMBING CHARTS.—No. 3.



Where lead pipe is used for waste or vent pipe it must be supported with boards when run on the horizontal and with tags soldered to pipe when run vertically.

CONTRACTS AND BUSINESS OPPORTUNITIES

General Building Notes.

J. D. Ferris, Brantford, will erect a \$2,000 building.

C. W. Chadwick, Toronto, will erect a \$12,000 dwelling.

J. C. Dietrich, Galt, will erect a business block there.

The Grand Trunk Railway is to build a new depot at Omeme, Ont.

Wm. Baby contemplates erecting a new brick business block at Chatham.

A two-storey brick building will be erected at Nelson, B.C., by Green Bros. & Burden.

Work has commenced on the Ottawa Hunt Club building, which will cost \$20,000.

Building permits at Fort William up to Sept. 1, this year, amounted to \$1,203,000.

The Royal Trust Co., Vancouver, will erect five houses at Fairview at a cost of \$15,000.

The Concrete Engineering & Construction Co., Vancouver, is building a \$13,000 block at New Westminster for A. L. Lavery.

Recent building permits at Hamilton include C. Roach, two houses, \$2,000; F. J. Rastrick & Sons, addition to store, \$3,000.

Dr. Cuthberston will erect a \$20,000 block of stores and offices at Toronto, and Smith & Taylor will build a \$16,000 business block.

Plans have been prepared by Dowler & Michie, Calgary, for a \$3,000 bungalow for R. S. Whaley, and for a \$4,500 residence for C. P. McQueen.

Oullet & Levesque, Quebec, have prepared plans for a two-storey clubhouse to be erected at Fraserville, Que., for the Cercle de Fraserville, at an estimated cost of \$12,000.

If the city will guarantee bonds for \$75,000 and give a fixed assessment for ten years, W. Telfer, proprietor of the British American Hotel, Kingston, offers to erect a new building there to cost \$150,000.

It is stated on good authority that the Canadian Bank of Commerce are negotiating for the purchase of a valuable site at Halifax and that in the spring the bank will proceed with the erection of a handsome building.

The plans and specifications for the Chateau Gatineau at Ottawa are completed, and the structure is estimated to cost \$30,000. Walter B. Walby and W. E. Noffke are on the lookout for a suitable site, as it is the intention to have the hostelry completed for occupancy next summer.

The following permits were issued recently at Vancouver: Vancouver School Board, addition to Kitsalano School, \$11,000; J. Oben, bakery, \$5,800; R. Goldberg, \$225; R. F. Harris, \$900; Dr. Powell, repairs to Inns of Court Block, \$2,000; J. Jasper, \$2,000; J. Stanley, \$3,000; Capt. Bailey, \$1,800; W. S. Kales, \$1,200.

Public Buildings.

A new \$75,000 jail is suggested for Hamilton.

A Catholic college is proposed to be built at Regina.

A new \$4,000 school will be built at Aberdeen, Sask.

Stratford's new Normal School is nearly completed.

St. Mary's new \$33,000 school at Regina is nearly completed.

It has been decided to enlarge the Hamilton Collegiate Institute.

A \$3,600 addition will be built to Brockville's Isolation Hospital.

The Chinese of Victoria will erect a three-storey school at that city.

A \$4,000 addition is proposed to be erected to the Burford, Ont., school.

J. G. Morgan will erect the \$1,200 temporary High School building at Yorkton.

A new vaudeville theatre, estimated to cost \$45,000, is to be erected at Toronto.

On the brick addition to the Supreme Court House at Halifax work is being pushed.

The Ottawa Government has voted \$5,000 towards the erection of a post office building at Souris.

Work is rushing on the new \$130,000 Anglican Cathedral at Halifax. Recently a night shift was put on.

Tenders are called for the erection of a new eight-room annex to the Winter Street School, St. John, N.B.

The contract for the magazine for the Militia Department, Toronto, was awarded to Anders Jordal, the price being \$3,500.

Davenport Road Presbyterians and Queen Street East Presbyterians will erect new churches in Toronto. The former will spend \$25,000, and the latter \$16,000.

The Moose Jaw Collegiate Institute Board has rescinded its motion accepting the Moose Jaw Hardware Co.'s tender for heating, and will ask for new tenders, owing to cost of building alterations.

The Building and Grounds Committee are getting estimates for the cost of erecting a new Collegiate Institute at Brantford. It is proposed to erect a

sixteen-room building with an annex of at least five rooms.

The Halifax Board of School Commissioners opened tenders last week for a brick school building on Chebucto Road. The Board decided to have a 14-room building, and accepted the tender of S. Marshall & Son. for a 12-room school at \$75,997.

Tenders are being asked for the several trades required in connection with the building of a Presbyterian Church at Hespeler, and for the supply of cast iron pipes, special castings, hydrants, valves and valve boxes for the Hespeler system of waterworks.

The Wallaceburg School Board contemplate heating the schools with natural gas, and at their last meeting appointed trustees R. T. Riddell and G. B. Pierce to visit other places where natural gas is used, and ascertain whether or not it is cheaper than other fuel. If their report is favorable, contracts for piping, etc., will be let.

Waterworks and Sewerage.

Rockliffe, Ont., will spend \$8,000 on a sewerage system.

Thorold's new waterworks system is almost completed.

Haileybury's new waterworks system is nearing completion.

Toronto will spend \$5,180 on sewer extensions on certain streets.

Bowmanville, Ont., is suffering from lack of a waterworks system.

It has been decided to go ahead with the construction of the Duke Street sewer. Preston.

A successful test was made of the fire pressure with Montcalm's (Que.) new waterworks system.

It is stated that tenders for a new waterworks system at Kelowna, B.C., will shortly be called for.

It is almost certain that Aylmer, Que., will have to instal septic tanks for the treatment of its sewage.

The construction of Cambridge Street sewer, Guelph, has been commenced, and the work on the septic tank is being pushed.

The plans for the \$18,000 sewerage system of Ottawa South have been sanctioned by the Provincial Board of Health.

Daniel Oates, Thorold, Ont., has obtained the contract for the laying of water services at that place at 18 cents per foot.

The contract for laying the 12-inch intake pipe at Portage la Prairie has been awarded to Holmes & Kirkmond, at \$3,630.

T. H. Tracey, Vancouver, has been retained to make surveys for a permanent

water supply for Nanaimo, B.C., at an estimated cost of \$100,000.

Tenders have just been taken by J. S. Floyd for sewer construction on Oak Bay Avenue, Hampshire Road and Saratoga Avenue, Oak Bay, B.C.

The ratepayers of Red Deer, Alta., have carried the following by-laws: \$30,000 for sewer construction and \$2,300 for purchasing land for waterworks.

The pipe line from the gas fields to Blenheim is now under way, and natural gas will be delivered there by Dec. 1. Comber is also in line for securing natural gas.

The work of laying the water mains at Palmerston will soon be completed, and fair progress is being made with the installation of the other parts of the waterworks system.

Work on the new reservoir for Newmarket's waterworks has been commenced. It is to take the form of a stand-pipe, built with concrete and steel the contract price of which is \$3,000.

It is expected that the new experimental station for the testing of water and the treatment of sewage at Toronto will be completed this fall. It is being built for the Provincial Board of Health.

New tenders will be asked for the steel tank and other iron fittings for the high level tower in connection with Montreal's waterworks system, owing to other tenders being considered too high.

The Peterboro Board of Works Committee is considering the construction of a new outfall sewer on Park St. and is bringing Willis Chipman, an expert Toronto engineer, to advise them in the matter.

Work has been commenced on the laying of the submarine water main across the Second Narrows at Vancouver. This is to be the connecting link between the Seymour Creek water system on the north side of the inlet and the distribution system now installed throughout the city.

The Eagle Place and West Brantford sewer, for which McGrath & Reid have the contract, is being rushed forward rapidly. At the foot of Market Street there is a river crossing of about 533 feet to be made at a depth of about six feet, and the sewer has been constructed for about one-half of that distance.

Contracts for water mains were let by the Toronto Board of Control to J. H. McKnight & Co., at \$5,143.25 for laying a 16-inch main from Dufferin Street to city limit; A. W. Godson & Co. to lay 20-inch mains from Bathurst Street to Earnbridge Street, at \$10,-

662.30, and from Earnbridge Street to Roncesvalles Avenue for \$7,137.20.

The extensive sewer and waterworks programme mapped out by the city of Saskatoon at the first of the year is now more than half completed. The work is being done by the Saskatoon Construction & Engineering Co. The work contracted for will be finished in about four weeks. The city will then be supplied with about 29,000 feet of water mains, and 18,000 feet of sewers. Of the work undertaken this year 12,250 feet of water pipes of various sizes have been laid and 7,830 feet of sewer pipe. Of the work contracted for there yet remains 5,000 feet of water pipes and 4,000 feet of sewer pipes to be laid before the season closes down. Besides the above the board of works figure on extending the sewer and waterworks system still further. They have called for tenders on an extension to Alexandra School, on the west side, and to the new city hospital at the north end. It is also proposed to extend the water system up Caswell Hill for fire protection. As far as the work has gone this year 25 hydrants have been installed along the route of the water main, thus giving the central part of the city at least good fire protection.

NOW READY FOR DELIVERY.

What is probably the most elaborate catalogue ever issued by a Canadian manufacturer is the new book just issued by the Standard Ideal Manufacturing Company, Port Hope, Ont. The book has been promised for a long time but the printers have been delayed in completing it. Delivery is promised however, for October 1 and master plumbers throughout Canada who do not receive their copy promptly should forward their business card to enable the manufacturers to make certain that their address is entered promptly on the mailing list.

FOR THAWING FROZEN PIPES.

It is rather unseasonable to talk of frozen pipes during this warm weather, yet it will not be long before old King Frost will be here, and knowing this, it is not so much out of place to tell of the Burbank Thawing Machine—a machine for thawing frozen water pipes underground—manufactured by the Burbank Thawing Machine Co., Berlin, N.H., and described in a booklet issued by that concern. After years of experimenting, E. A. Burbank, a master plumber, devised the successful apparatus which bears his name. He claims for his machine that it is the only practical work-

ing device which does the work quickly and economically and without the trouble and expense of digging down to the pipes. The machine is pictured and described in detail in the booklet, which will be sent on request. The machine weighs but 125 pounds, and is always ready for use. It will thaw hydrants, sewers and water mains. A number of testimonials from responsible officials is published.

DRINKING FOUNTAINS.

The above is the title of a little booklet issued by the Crane Co., Chicago, devoted to drinking fountains generally, but more especially calling attention to a new pedestal fountain. At the present time there is a steadily increasing demand for public drinking fountains to replace the old-fashioned insanitary cup and glass. Schools, factories, hospitals, railway depots and amusement resorts are installing this new kind of drinking fountain, which does away with the cup on the chain, the water bubbling in a continuous stream through an automatic faucet in the centre. The lips come in contact with running water only and do not touch the metal at any time, thus practically eliminating the possibility of germs being transmitted. The faucet is made with either constant stream or bubbling attachment, which may be used in pedestal, wall or multiple fountains. Being illustrated, the booklet gives a better idea of the new pedestal fountain than any written description, and it may be had for the asking.

REMOVABLE CASING FOR TANKS.

That the lustre and beauty of a closet combination is often spoiled before the bathroom in a new building is completed is well-known, and, taking this fact as a text, the Ideal Manufacturing Co., Windsor, Ont., and Detroit, Mich., has issued an illustrated circular descriptive of the "New Ideal" bentwood casing for a low tank. The casing being removable it is only necessary to remove it until the decorations of the bathroom are completed. These casings are handsome in appearance, graceful in design, and perfect in construction; and if the home is being remodelled a new casing may be had to match the finish of the new interior decorations.

The \$60,000 addition to the Queen Hotel, Halifax, is rapidly nearing completion. The plumbers will start the work of installing the baths, etc., this week.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Sept. 28.—Business continues to show the improvement noted in our last issue. Orders generally are of larger bulk, and it would appear as if plumbers were not only more busy, but with the betterment of conditions were paying greater attention to the replenishment of their stocks. The supply houses are showing an activity that is distinctly encouraging, and, in some lines, which have their best season in the fall, business has developed into a rush. Outside Montreal very good trade is being done. Three Rivers, while not buying in large quantities as yet, as building will not really start until next year, is taking fair quantities of stuff, while Sherbrooke, St. Johns, Sorel and other smaller towns are placing very satisfactory orders.

Building operations for the month have been very good, although on the small side. There has been a great expansion of residential building outside the city proper and plumbers are assured of plenty of work for some time to come. Jobbing orders have continued good, and most shops report plenty of work doing.

Prices generally remain unchanged. Supplies are ample, except in one or two lines where a rush has developed, but manufacturers by working at full pressure are minimizing the delay as much as possible.

IRON PIPE—Trade has been very good, orders from outside districts being heavier than expected. Inquiries are very satisfactory and it looks as if stocking-up was being contemplated by many plumbers. Prices are unchanged in iron pipe as well as cast iron and malleable fittings.

SOIL PIPE—Orders show a stimulation, and conditions generally are most satisfactory, considering everything. The country demand continues to keep good. Prices are unchanged, and we quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Orders are picking up, and a good volume of trade is now moving. Supplies are in fair shape, and we continue to quote pipe and waste at 30, and traps and bends at 50.

SOLDER—Solder is in better demand again, probably owing to the fact that roofing is more general. Prices are unchanged, and we continue to quote 19c for half-and-half and 18c for wiping.

ENAMELWARE—The demand for enamelware continues heavy, and manufacturers are overwhelmed with orders for the time being. Consumers have held off buying, but now the houses are ready and the ware is wanted immediately.

Prices on the better class article are generally unchanged.

BRASS GOODS—The demand is fair, although the market has not picked up so well as some of the other markets have done. Prices are about the same. There is no change in fuller work and compression work.

RADIATORS AND BOILERS—The demand continues to be satisfactory, and some promising orders are going through. In fact manufacturers report extremely busy times all the way round. We continue to quote: Radiators, at 52½, and boilers at 50 and 10 off. Steam-fittings are now 60 and 10 off, with a fair demand.

METALS—The metal situation has not changed much. Copper shows signs of sagging, but lead and imported pig iron are firmer. We quote: Ingot copper, \$14.25; ingot tin, \$32.50; lead, \$3.60; pig iron, Middlesboro No. 1, \$18.50 to \$19. Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 2½c.

TORONTO.

Toronto, Sept. 30.—As surmised a fortnight ago, the plumbing trade in all its branches is experiencing a larger degree of activity, and trading is increasing from day to day. Although not so great as this time last year, the volume of business being done at present is much ahead of the early months of the year. The city trade is still growing, but country business might be better than it is. October, however, should see quite a number of country orders going out. Many jobbers along the lakes stock up before the close of navigation, as shipping by boat they save something on freight.

Prices are practically unchanged, although there is a slight decline on cast iron fittings, and a little advance in the price of half-and-half solder. Soldering irons are easier.

IRON PIPE—For 1-in. black the quotation remains at \$5.11 and for 1-in. galvanized \$6.76 is the price set. Cast iron fittings are easier and have declined from 62½ and 65 to 65 and 70, and some jobbers sell even better than this. Malleable fittings run from 35 to 37½ off. Large supplies are being carried.

SOIL PIPE—Supply and demand are fairly good. Prices remain at old quotations. Light pipe is 60 and fittings 70 per cent., and medium and extra heavy pipe and fittings are 70 per cent.

LEAD PIPE—Good business is being done in this line with ample supplies on hand. There is no change in price quotations. Traps and bends are at 50 per cent. and pipe and waste at

30 per cent. Calking lead runs from 4½c to 5c per pound.

SOLDER—A good call is made for the various grades of solder and just now it is an excellent seller. Supplies keep moving so rapidly that there is very little chance of stocking up. Wiping continues unchanged at 18c, but half-and-half has advanced a little and now runs from 19c to 20c.

BRASS GOODS—While there is plenty of stock on hand just now the trade in brass goods has picked up very well and at present is better than during the year past. Prices on fuller and compression work are at the old figures but there is a slightly easier feeling in regard to values.

ENAMELWARE—There is a brisk demand for this line of goods at present and jobbers express a difficulty in getting sufficient supplies. The old price quotations prevail.

BOILERS AND RADIATORS—These fall months are in the very heart of the season when demand for heating goods is at its height. September has been the best selling month of the year so far, and from expectations October should be better.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as \$1,000) are allowed as one word.

Cash remittances to cover cost must accompany all advertisements. In no case can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

PERIODICALS.

COMPLETE information on books, stationery, fancy goods, music, photo supplies and kindred lines is given each month in THE BOOKSELLER AND STATIONER, of Canada. Subscription price \$1 per annum. Address, 10 Front Street East, Toronto.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, posters. The Hough Lithographing Co. Limited. Office, No. 3 Jarvis Street, Toronto Telephone, Main 1576. Art, good workmanship business methods.

7,217 NATIONAL CASH REGISTERS were sold during May 1908. That's 2,047 more than was sold during May 1907. The National Cash Register Co., F. E. Mutton, Canadian Manager, Cor. Yonge Street and Wilton Avenue, Toronto, Ont.

ADDING TYPEWRITERS write, add or subtract in one operation. Elliott Fisher, Limited, 129 Bay Street, Toronto.

BUSINESSES FOR SALE.

A PLUMBING. Heating and Electrical Business for sale in good Ontario town. Stock carried upwards of \$4000, or might sell an interest to good man conversant with plumbing and heating and capable of managing the business. Address Box 749, PLUMBER AND STEAMFITTER, Toronto. (21)

DRIFT PLUGS



PLUMBERS' TOOLS

Made from the highest grade
of material and fully guaranteed

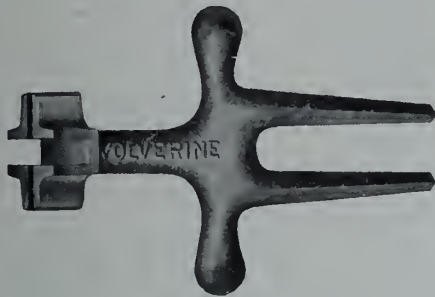
TURN PINS



BIBB SEAT DRESSER



WRENCH



WASHER CUTTER



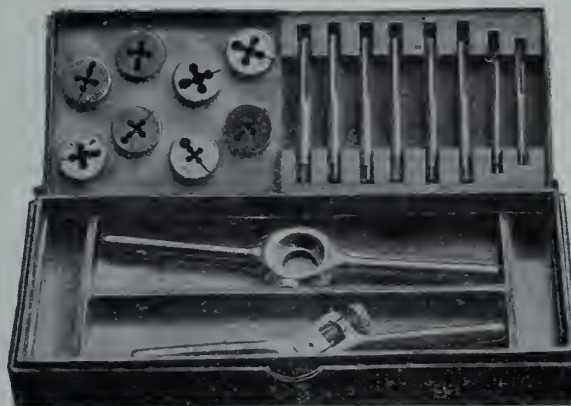
COMBINATION PLIER



SHAVE HOOK



SET OF TAPS, DIES, ETC.



Contains Die and Tap of each following sizes : 6-32, 8-32,
9-32, 10-24, 10-28, 10-32, 12-24, 14-20.

CAULKING TOOLS



BENDING SPRING HOLDER



Several hundred tools illustrated in Catalog "F"

Canadian Wolverine Co.
Chatham, Ont.

Backed by a Guarantee

All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large

Works at Valleyfield

If your nearest dealer does not handle our goods, write us.

EVERY PLUMBER AND STEAMFITTER

in Canada has some want which could be satisfied by a small condensed advertisement in our paper.

We reach twice each month almost every plumber and steamfitter from one end of Canada to the other. It seems reasonable to suppose that some one of our readers will want to buy just what you have to sell, or will want to sell just what you have to buy.

The rate is low. 2c. per word for the first insertion, 1c. per word for subsequent insertions. Send cash with advertisement to our nearest office.

PLUMBER AND STEAMFITTER

MONTREAL

TORONTO

WINNIPEG



THIS IS THE DAY OF

INVESTIGATION

Get in line and let us prove to you that the

**GENUINE
Armstrong Stocks and Dies**

ARE THE BEST.

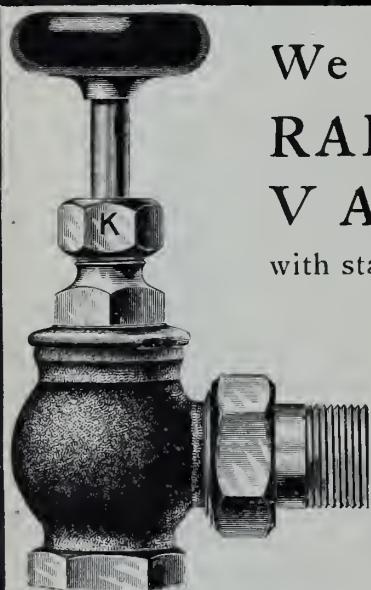
Catalogue on request.



The Armstrong Mfg. Co.

317 Knowlton St.

Bridgeport, - Conn.



Sizes $\frac{3}{4}$ " to 2".

We make these RADIATOR VALVES

with standard brass disc, and with the Jenkins Disc, with and without Unions.

They are made from good metal, tastefully machined, and are handsomely plated and polished. Mounted

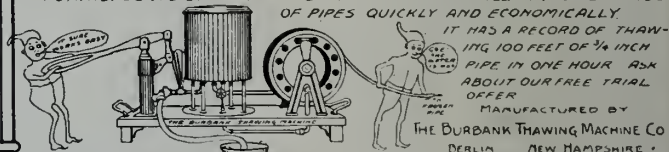
with best quality Wood Wheels. The Valves are right and the prices are right. All the large dealers sell KERR Valves. Ask for them. Our name is on every valve, and it guarantees the quality.

THE KERR ENGINE CO., LIMITED
WALKERVILLE, ONTARIO

THAWING FROZEN WATER PIPE UNDERGROUND

WITH A BURBANK THAWING MACHINE,

— ANYONE WHO CAN REPAIR A BROKEN PIPE OR DO SUCH WORK CAN USE IT
— ITS BUILT FOR HARD USAGE. SIMPLE, CONVENIENT AND EFFICIENT
— FURNISHES ITS OWN SUPPLY OF HOT WATER. WILL THAW ALL KINDS



IT HAS A RECORD OF THAWING 100 FEET OF $\frac{3}{4}$ INCH PIPE IN ONE HOUR. ASK ABOUT OUR FREE TRIAL OFFER.

MANUFACTURED BY

THE BURBANK THAWING MACHINE CO.

DERLIN, NEW HAMPSHIRE.

INFORMATION

about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect all the items of information appearing in Canadian newspapers about any subject you are interested in. Our service is thorough. We don't miss an item. If you want all the current information about a pet subject, we can supply it at the lowest cost. By using our service you can keep posted on any subject.

WRITE FOR OUR FREE BOOKLET.

**THE CANADIAN PRESS
CLIPPING BUREAU**

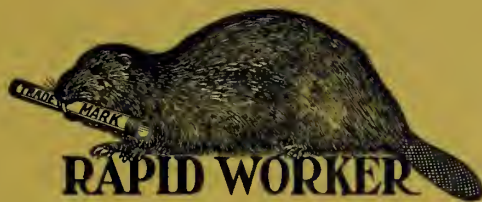
232 McGill St., Montreal.

10 Front St. E., Toronto.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2"
perfect threads, all
with one set of chasers



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

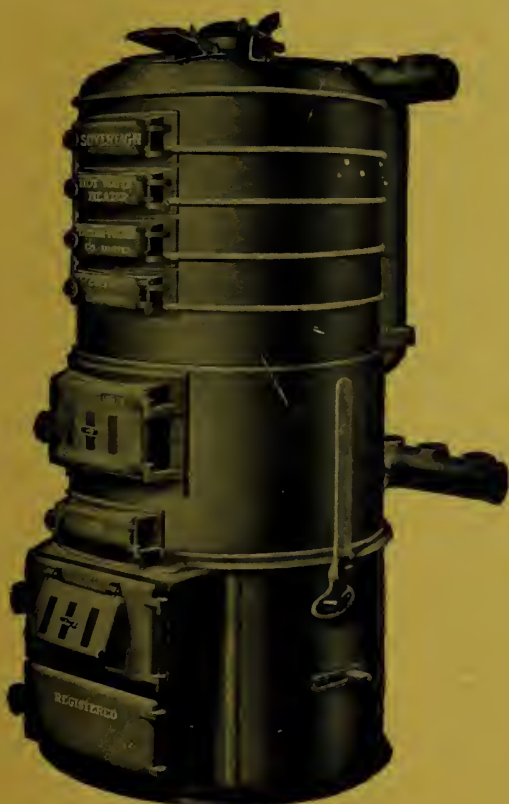
Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Manufactured by

Borden-Canadian Company

66 Richmond Street East, Toronto



The Sovereign Boiler

ASSURES PERFECT WATER CIRCULATION

In all boilers but the Sovereign, the holes in the water post are of the same size. In the Sovereign the lower pair are larger than the others. This improvement results in a much more free and rapid circulation, preventing the water from boiling in the heating sections. The Sovereign Water Post is divided into two interior sections; the water flowing into it at the bottom on the lefthand side, passing into the righthand side, after having made a complete circuit of the five boiler sections.

WRITE FOR OUR DESCRIPTIVE BOOKLET

Taylor-Forbes Company, Limited

HEAD OFFICE and WORKS, GUELPH, ONTARIO

TORONTO—1088 King St. West MONTREAL—122 Craig St. West
ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St. QUEBEC, QUE.—The Mechanics
WINNIPEG—The Vulcan Iron Works, Limited Supply Company
VANCOUVER, B.C.—Taylor-Forbes Company, Limited
CALGARY—The Barnes Company, Limited



THE STANDARD Ideal CO.

LIMITED

¶ This is one of the many new designs in Lavatories, that we have now ready for the market.

¶ We are also making a number of Baths, Laundry Trays and Roll Rim Sinks, which are entirely new.

¶ Particulars of these can be obtained on application to our Head or Branch Offices.

Head Office and Factories, Port Hope, Ontario

Branch Offices and Sample Rooms:

Toronto, 50 Colborne Street; Montreal, 128 West Craig St.; Winnipeg, 154 Lombard St.

The Labatt Manufacturing Co., Limited

MANUFACTURERS AND JOBBERS OF

Plumbers', Steamfitters' and Engineers' Supplies

High - Grade Plumbing Specialties,
Tools, etc.

367 Queen Street West
TORONTO

and

Bathurst Street
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PLUMBER & STEAMFITTER

and Sanitary Engineer of Canada

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St.

TORONTO, 10 Front St. E.

WINNIPEG, 511 Union Bank Bldg.

LONDON, ENG., 88 Fleet St. E.C.

Vol. II. No. 20. (New Series).

Publication Office : 10 Front St. East, TORONTO, OCT. 15, 1908.

Old Series, Vol. XX. No. 20



"IT'S JUST AS GOOD"

AS THE

DAISY

is the talk some people use when they try to sell their boilers, yet, unconsciously they pay a tribute to the DAISY'S WORTH and PRESTIGE.

There is but One Genuine

that is just as good, and it is the incomparable, unapproachable pioneer of HOT WATER Boilers, 30,000 of which are in active service—its name, need we tell you, is

The DAISY

Built on honor—of the best materials money can buy, by superior workmen, under the direction of competent engineers, and at the best plant ever devoted to the production of a Hot Water Boiler.

CATALOGUE ON REQUEST

CLUFF BROTHERS

Lombard Street

Toronto

SELLING AGENTS FOR WARDEN KING, Limited.

"NO BEGINNING, NO END"
TO
WOLVERINE SPECIALTIES

Begin to order "WOLVERINE GOODS" and there will be "No Ending."



For
Prices
write
to

For
Catalog "F"
write
to

CANADIAN WOLVERINE CO., CHATHAM, ONT.

That there is

No Turning Back

to be done with the

"BUCKEYE"

DIE STOCK

MEANS—

That the dies open (and automatically) when the threads are finished.

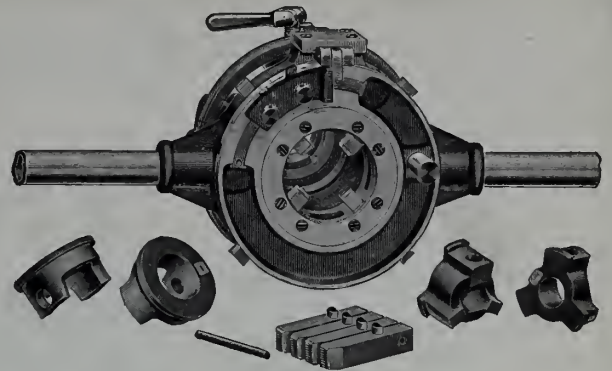
That there is no leader screw to run back on before another thread can be cut.

That without a leader screw, the user is relieved of many troubles.

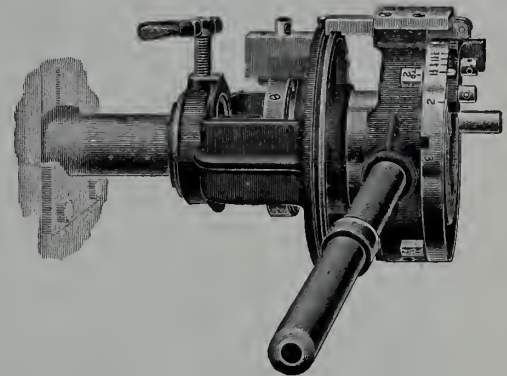
That a thread is not going to be spoiled after it is cut.

These facts pertain to a tool that has the

**NARROW, EASIEST-CUTTING
STYLE OF DIES**

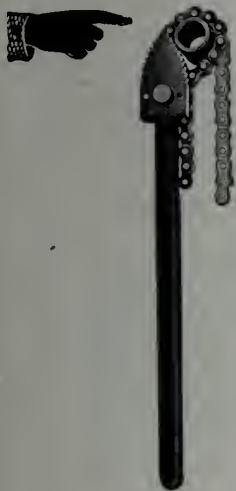


FRONT VIEW



SIDE VIEW ON PIPE

The Hart Mfg. Co., 1375 E. 3rd St., Cleveland, Ohio, U.S.A.

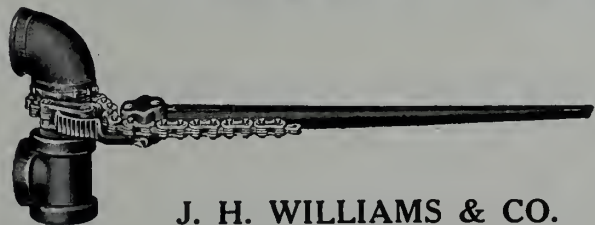


DISCARDED FEATURES

threaten you. See the chain? It will of its own weight fall from its locking pockets when working overhead. It threatens you with grave dangers when working in elevated positions. Discarded by us years ago, it is now being advertised as permitting a shift from one to other side of pipe without removing chain. It will permit the shift but it brings dire dangers with it because it

is not safe in all positions. We are pioneers in, and all our lives have studied, chain pipe tools. The "Agrippa" Single Jaw is without mechanical or construction fault—the only absolutely safe tool of equal capacity for crooked fittings or pipe. There's no other. Guaranteed and on trial from your dealer.

"AGRIPPA"



J. H. WILLIAMS & CO.
Pioneers in Chain Pipe Tools
BROOKLYN, NEW YORK

OUR "WANT ADS."

get clerks for employers and
find employers for clerks.

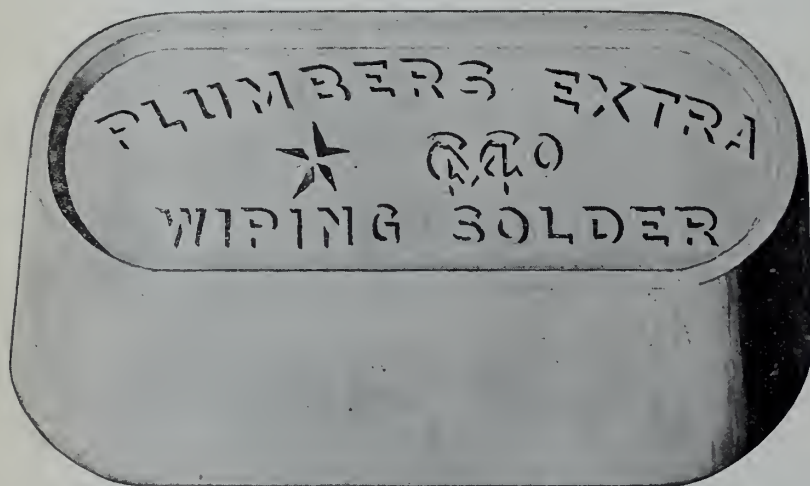
MONARCH COCKS AND VALVES

lead in quality
lead in design
lead in price

and all leading Plumbers use 'em.

THE MONARCH BRASS MFG. CO., Ltd.

Office and Warehouse - 278 Dundas St., Toronto



Works Like Putty Sticks Like Glue

Best Wiping Solder. Nothing like it.
If your supply house has not got it, get
it from the manufacturers.

The Canada Metal Co.,
Limited TORONTO

MENSURATION FOR Sheet Metal Workers

By Wm. Neubecker

This new exhaustive book gives in detail examples in computing the circumferences, areas and capacities for various shapes arising ordinarily in shops, including the areas of heating and ventilating pipes making them equal to those of pipes of other profiles. All the rules and tables are fully explained and easily understood.

72 Subjects 70 Figures

Price 50c., Postpaid

All orders payable in advance)

MacLean Publishing Co.

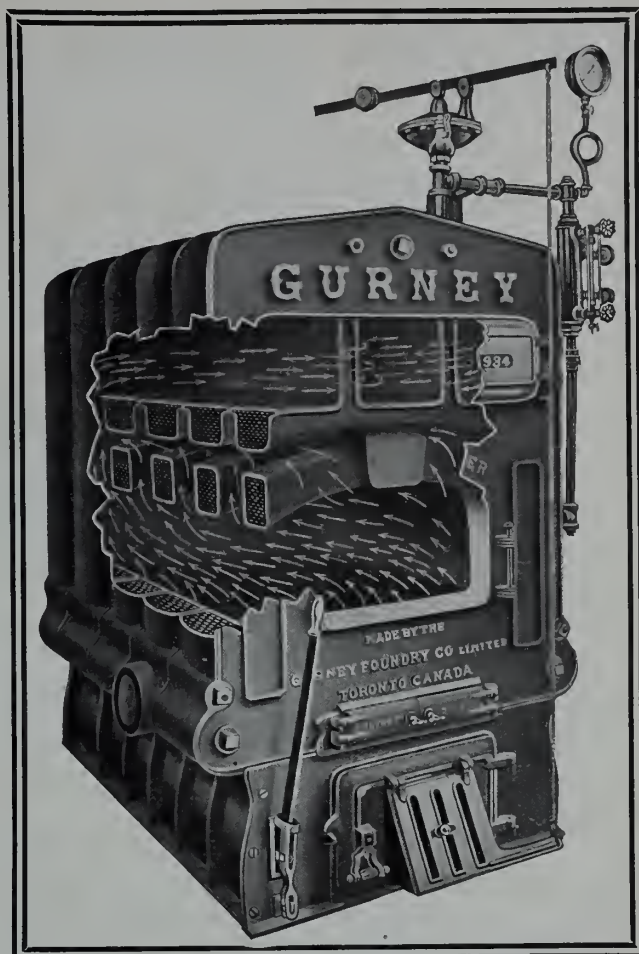
Technical Book Department
10 Front St. East, - TORONTO

Of Course, you can SELL any kind of a boiler. BUT—

You want to be sure you SATISFY the customer to whom you sell. Otherwise, there is no actual profit in that sale for you.

There is one boiler built—and ONLY one built by any Canadian maker—which you can bank on to not merely sell, but to profit you every way you want profit: in money because it sells easier for less effort; and earns you the fairest possible percentage on that effort.

In reputation, because it will make good the strongest reasonable assertion you put forth for it. In growth, because it is so certain to justify your claims, and its price, that the person who owns it will pass the news on, boastfully, to his fellows. That boiler is one of the



GURNEY 900 Series Steam Boiler



5 Reasons why:--

It is built to meet Canadian conditions, by a Canadian maker.

It provides a big bulk of water in the walls of the firebox, instead of a thin sheet. You know what **that** saves in bother to the owner.

The firepot walls are straight, self-cleaning, bother-proof—not sloping and hard to get along with.

The water line is four or five inches below the top push-nipple—and **that** helps a lot.

Fitting strips are provided between sections so rust-cracks won't happen, as in other boilers.

Get right with all the selling points, send for the catalog that shows **WHY** you want to push this boiler this season and every season.

The Gurney Foundry Co., Limited

Toronto
Montreal

Hamilton
London

Winnipeg
Calgary

Edmonton
Vancouver

Did this question ever strike you—

How easy it is to buy and if not perfectly
satisfied return the article at our expense—

That is the condition in which all **OUR** goods are put on the market.

Mr. PLUMBER—Do not forget that all goods bearing our name are backed by
a responsible five years' guarantee.

RIGHT NOW

we can furnish you all the material for a complete Heating or Plumbing Job
within twelve hours.

Write, wire or phone—we want your business.

GENERAL BRASS WORKS, LIMITED

69 Sterling Road, - Toronto

Eastern Representative:—T. J. Carlind, 150 Mansfield St., Montreal

BOOKS FOR PLUMBERS AND STEAMFITTERS

Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

American Steam & Hot Water Heating Practice	\$3 00	Hot Water Heating, Steam & Gas Fitting, Acetylene Gas—How Generated and How Used. By J. J. Lawlor and Geo. T. Hanchett	2 00	Principles of Heating. By W. G. Snow	2 00
American Plumbing Practice	2 50	Kitchen Boiler Connections	1 00	Principles & Practice of Plumbing. By J. J. Cosgrove	3 00
American Sanitary Plumbing. By J. J. Lawlor	2 00	Lighting by Acetylene Gas, Electric Furnace Generators & Burners. By W. E. Gibbs, M.E.	1 50	Principles of Hot Water Supply. By J. W. Hart	3 00
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Contract & Estimate Record Book for Steam & Hot Water Heating. By B. H. Jessup	1 50	Notes on Heating & Ventilation. By J. R. Allen	2 00	Sanitary House Drainage; Its Principles & Practices. By T. E. Colman	2 40
External Plumbing Work. By J. W. Hart	3 00	Outline of Ventilation & Warming. By W. J. Baldwin	1 00	Sanitary Plumbing & Drainage. By J. W. Hart	3 00
Fifty Plumbing Charts	25	Plumbers' Text Book, 300 Questions and Answers. By Frank Tower	1 00	Sanitation in the Modern Home. By J. K. Allen	2 00
Formulas & Tables for Heating. By J. H. Kinealy	1 00	Plumbing Catechism. By C. B. Ball and H. T. Sheriff	1 00	Sizes of Flow & Return Steam Mains	50
Furnace Heating. By W. G. Snow	1 50	Plumbing & House Drainage Problems	2 00	Steamfitters' Computation and Price Book. By Dean	3 00
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Hints to Plumbers on Joint Wiping, Pipe Bending & Lead Burning. By J. W. Hart	3 00	Practical Heating, Illustrated. By A. G. King	5 00	Steam Heating & Ventilation. By W. S. Monroe	2 00
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House Heating by Steam & Hot Water. By C. B. Thompson...	3 00				

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co. 10 Front St. E., Toronto

Robertson's Plumbing Goods

are being specified and used and are giving satisfaction.
Why not! Try us, with your next order, we can make
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COLLECT ACCOUNTS PROMPTLY.

In continuing our editorial comments upon the reasons for so many plumbing failures throughout the country we would deal this time more particularly with the question of collections. It is an established fact that plumbers are much too easy over their accounts, and this has a lot to do with the inability of so many firms to make good in their venture. Plumbers have been made the mark for many a jest as to exorbitant profits, illegitimate waste of time, and a consuming desire to pull a house to pieces to get at a pipe; but we have never heard these same satirical people refer to the fact that the accounts rendered by these self-same fleecers of the family purse were ever unduly pressed, or even, to any extent, pressed at all. In fact the plumber's bill is put on the same pay-some-time-in-the-future level as the doctor's, with, if anything, the advantage, so far as ultimate settling is concerned, on the side of the latter who really can afford to wait longer as he has no journeymen's wages to provide weekly.

As we stated in our first article, the plumber is not by training a business man, that is from a purely com-

mercial point of view, unless it comes to him instinctively. His work does not permit of his acquiring the methods and systems of a well organized business house. To a man who has been brought up in the atmosphere of ledgers, the entering of an account and the prompt despatch of the invoice is a matter of almost mechanical precision. The one follows the other as naturally as butter does the bread. But with the man who has no experience with books, the case is very different. He has no love for figures, and, recognizing his shortcomings in this respect, he is naturally in no desperate hurry to open his books, or keep them up-to-date. A trying piece of plumbing work involving much theoretical and practical skill is much more to his taste than the few necessary minutes at the ledger.

What is the result. The entry of an account is often put off for the next day or day after with the consequence that probably some consumption of material is forgotten, or the journeymen's time not fully allowed for; small jobs are occasionally overlooked altogether; while the entries generally are followed up with little vigor. Unless the books are rigorously gone through regularly it is an easy matter for an account to slide until the debtor gets lost in the residential changes that occur from day to day, especially in a growing centre of population.

Entries must be followed up systematically, and with determination. The money is owing and should be paid. It is seldom that the cash will come in without a demand, for we do not live in a Utopian age. The plumber is a genial and easy going man. He does not like to press too strenuously for his account. But the laborer is worthy of his hire, and what is due should be insisted upon quietly but firmly. In pressing for the payment of an account, there is little fear of offending the customer who is honest in his dealings, and the one who takes umbrage is the man whose business is no good to any firm, for he probably never meant to pay if he could avoid it.

The average plumber is likewise too ready to extend credit. He is easily led away by the blandishments of the customer who promises a lot and fulfils nothing. There should be no hesitation to ask a man for a reference, and if he objects, refuse to do the work. It is better to be without an order, than to carry one out, and never get paid.

The success of a business hangs not upon the amount of work done during the year but upon the profits; the profits hang upon the prompt rendering and prompt settlement of the accounts, and therefore the young master

plumber should look after his accounts with the eyes of a hawk. Send out the accounts regularly, go after the long-winded debtors personally if possible. Leave no stone unturned to get prompt settlement. The debtor is holding money that is not his own, but belongs to the plumber and it should be promptly paid over.

DIDN'T FIGURE IN PROFITS.

"One of the 400" master plumbers in Toronto was passing a prominent corner in the residential district a fortnight ago when he noticed a quartet of men in earnest debate. Closer inspection showed them to be four out of work journeymen who had paid the dollar license fee and were now full fledged master plumbers.

Catching sight of the master plumber of many years' experience the four beginners called him in to settle their argument about the prices for which some house plumbing job had been tendered for. The lowest man had been \$4 under his nearest competitor, the four ranging from \$150 to \$160. Asked for advice the experienced master enquired as to the margin of profit that had been figured on but none of the four had included anything but labor and materials.

Here is a great need for education and while an association cannot hope to reach men who are masters to-day and journeymen to-morrow, an organization can do something in the way of securing the revision of the wide-open policy in force in Toronto which is resulting in cheapness rather than goodness being the aim of the men installing plumbing fixtures in houses and other buildings.

Something should be done to improve the unsatisfactory conditions prevailing in Toronto and masters who make no effort to build up an organization to raise the standard of plumbing work are not consistent in kicking about the way trade is cut up.

Let the architects and master plumbers work together to improve the grade of plumbing work and prices will soon right themselves.

WATER STORAGE DESTROYS TYPHOID BACILLUS.

It has been known for some years that the storage of water, undisturbed, has a beneficial effect in reducing the number of bacteria with which it may be infected. The question has recently been made the subject of extensive laboratory tests by Dr. A. C. Houston, Director of Water Examination, Metropolitan Water Board, London. Eighteen separate portions of water were infected with from forty to eight million typhoid bacilli, and bacterial counts were made, every week, until the typhoid germs had entirely disappeared. In one of the series of tests reported by the Scientific American ten of the portions of water failed to show any bacteria at the end of three weeks, sixteen at the end of four weeks, and in five weeks' time the whole of the eighteen portions failed to show any signs of the deadly germ.

The bearing of these laboratory tests upon the question of city water supply is evident; for where it is possible to store the water in suitable reservoirs, and maintain it in an undisturbed condition for a few weeks before drawing off, the city using that water is provided with an additional safeguard against the greatly-dreaded disease. On the other hand, Dr. Houston does not consider that undisturbed storage should be allowed to take the place of filtration.

The latter has proved to be a most effective safeguard against typhoid, and storage should be looked upon

rather as an additional protection, not as excluding the necessity for sand-bed filters. It is suggested that the time and expense of purifying a city's water supply might be reduced by using special storage reservoirs in combination with mechanical filtration at a specially rapid rate; and Dr. Houston expresses himself as being satisfied with a well-stored, rapidly-filtered water, rather than an unstored, slowly-filtered water. The difficulty of maintaining a sufficiently large quantity of water in an undisturbed condition for the necessary four or five weeks might be overcome by building such reservoirs in duplicate, the water being drawn off in one while the other was undergoing its period of rest. Though the cost of such a plant, especially in the case of the larger cities, would be heavy, it would be offset by the shorter time required to purify the water in the filtration beds, and the greater purity obtained by the twofold treatment.

PURIFYING AIR WITH OZONE.

Purification of air by means of water sprays, or air washing, as it is commonly called, is passing through period of development that has all the interesting features that attend other important developments in the art of ventilation. Since the introduction, on a commercial scale, of the air washer for use in business buildings the subject has received probably more attention on the part of heating engineers than any other one item connected with their business. The wonder is now that the matter was so long neglected, for to-day a heating and ventilating system, certainly one in a public building, is considered incomplete without some effective method of eliminating the dust and supplying the proper amount of humidity to the air.

Considering the time and money spent in the evolution of the air washer and the theory upon which the practical requirements have been worked out, it is somewhat startling to find the subject approached with apparent success, from an entirely different direction, says The Heating and Ventilating Magazine. Making use of the purifying qualities of ozone an apparatus has been introduced in Germany for the production of this element by means of electrical current. According to the description of the apparatus, its small size makes it convenient for use either in a room or in an air duct where, it is claimed, the ozone generated will probably nullify, if not destroy, the injurious particles in vitiated air, as well as revivifying such air. This, of course, has no bearing on the matter of dust removal which would remain to be taken care of by some other means.

The theory of such a device for purifying the air will recall to many the remarks of one of the speakers at a recent meeting of the heating engineers' society, a man who has given much time and thought to the study of air purifying. He had made the remark that where an air washer was used the air could be recirculated to some extent without any harmful effects upon the occupants of the building. "First of all," he said, "we know that the slight increase in carbon dioxide is not deleterious; the change or increase from 6 parts of carbon dioxide in 10,000 parts of air to 10 or 20 parts is not deleterious, but we use that only as a measure to determine how vitiated the air is. The things that are really deleterious are the epithelium scales that come from the throat as we breathe and the organic matter carried with the moisture. If we wash that out of the air, substituting for this moisture other moisture, we purify and revivify it, but we do not take out the carbon dioxide."

Healthy and Diseased Plumbing

Henry B. Davis, Inspector of Plumbing, Washington, in the Domestic Engineering.

At no time in the history of plumbing and sanitation has there been more thought and study given, nor has there been in the past such advancement in regard to sewage disposal and the water supply system,—no such watchfulness of pollution, nor more progress made in scientific consideration of plumbing construction and fixture manufacture, as is now taking place, and will continue in the future.

This awakening is due to epidemics of disease in various localities attributable to contaminated water supply and defective drainage systems, and it has caused action to be taken by legislatures of nearly all states, and the passage of laws requiring state and city boards of health to guard the water supply of cities and prevent the pollution of streams by sewage and drainage from villages and towns when used by other cities for water supply; also requiring the installation of adequate sewage disposal and water supply systems to care for each city or town, and requiring the placing, under competent inspection, of modern plumbing within houses, relegating the sacred town pump, disease-breeding, leaking privies, cess-pools and contaminated wells to oblivion. The numerous instructive articles appearing in magazines and books devoted to plumbing and sanitation, and the work of the associations, societies and manufacturers of plumbing goods, are all contributing advanced ideas for greater improvements in fixtures and in plumbing construction. The manufacturer is constantly on the alert to place on the market the latest designs in sanitary invention, and is contributing to the education of the public generally by the distribution of thousands of expensive catalogues showing modern non-absorbent plumbing goods made of glazed earthenware, vitreous china and enameled iron.

Changes in Fixtures.

The enameled iron fixtures are proving very satisfactory, and are cheaper for tubs, lavatories, and sinks, than either of the two other materials, and with care will last for years. The advancement in fixture designs makes it possible by a small outlay of cash for an owner to remove the old copper-lined tub, usually patched, depressed and leaking, the straight hopper pan or plunger water closet used in the past, with all its defects, such as fouling surfaces and wooden enclosures, which ab-

sorb urine, waste water and filth and which offer harbors for vermin and refuse. The doing away with these unsanitary fixtures also removes the obnoxious inaccessible lead safe under them, which retained stagnant water and slops to give off odors. These old fixtures were usually placed in the cellar or improperly lighted and illy ventilated rooms and were certainly objects to keep out of sight. In their place we have now the use of non-absorbent open plumbing fixtures, free from wood-work, placed in toilet rooms which are well lighted, heated and ventilated, and having tile floors and walls, and occupying a prominent and convenient position in the house, where the sun, air and a little work will keep them in a sanitary condition. Such a change is as great as that from a ride in the old-fashioned, slow-moving horse car and the rapid-moving electrically propelled and heated car.

While the fixture makers have made great strides, the important and vital parts of plumbing construction, namely, the cast iron pipe and fittings and the brass traps and waste of fixtures are not keeping up with the march of progress. This is due no doubt to great competition in trade, and manufacturers are taking liberties close to the danger line, especially with the cast iron pipe and fittings, which is found in many cases to be of low grade material, roughly finished and light in weight; and the makers of nickel-plated brass traps and waste to fixtures are making them of nickel-plated iron which rusts at threads, and when of brass thin gauge metal is used, so that it is almost impossible to cut a thread on these pipes without cutting through the metal, and there have been any number of cases where the pipe has been so weakened by cutting the thread that any undue strain pulls it apart. It is the duty of those whose knowledge makes them familiar with weak spots of plumbing construction to prohibit such work. The American Society of Inspectors of Plumbing and Sanitary Engineers are making tests and working to establish a standard weight and thickness of all materials used in making these goods. It is the hope of this society, also, to bring about uniform plumbing laws to govern plumbing installation and the appointment of inspectors of plumbing to see that work is properly performed.

The duty of guarding against this defective material falls properly upon the inspector of plumbing and his assistants. He must see that all pipes used are of proper size, weight and thickness as prescribed by most plumbing regulations; that a sewer is of ample size and has the required minimum fall of $\frac{1}{4}$ inch to the foot, is laid straight, or with as few bends as possible to outlets for stacks, and trapped outlets for area and yard drains and downspout terminals; that all the joints are well caulked with lead and oakum; that no cracked pipe or fittings have been used or doctored (as is the habit with some journeymen plumbers unless they are watched), and last, to be reasonably sure there are no leaks. This is determined by a water test on the sewer from its connection with the public sewer to the terminal in the yard, under a head of water of at least five feet, and the sewer is not permitted to be covered until this test is made under inspection, and the work passed by the inspector of plumbing or his assistant. After the sewer is laid, the work of roughing in begins, such as running soil and vent stacks and the waste and vent pipes for small fixtures; when finished, the outlets are plugged or sealed and an air test applied under inspection, and finally when the entire work is completed a smoke or peppermint test is applied to the entire plumbing system and the work not passed by the inspector or his assistant or certificate issued by the chief inspector of plumbing until all piping and fixture connections are perfectly tight, and in accordance with plumbing regulations.

Fresh Air Inlets.

The next subject of importance is the running trap and fresh air inlet, which is placed on a house sewer at the curb or in the parking, to prevent the public sewer air and gases from entering the house sewer and house through some unsealed fixture trap. This is accomplished by the deep water seal of the trap. The running trap on a sewer can be likened to the vermiform appendix in the human body, for its use to a sewer is as much a matter of doubt and controversy among sanitarians as the appendix is among physicians, and like that appendage it is often removed without detriment to the system. The articles which have been written pro and con for years on this subject would, if compiled, make a good-sized book. The object of the fresh air inlet is to

provide a circulation of air down the inlet pipe to and through the house sewer, up the soil stack to circulate air to the small vent and waste line and out vent stack to the roof; and to accelerate this movement of the air the soil and vent stacks are required to be placed within the house where the heated air imparts its warmth to the pipes. The upward movement of the air is often reversed, especially during a hard wind or a rain storm, and frequently when a large fixture is discharged; then the fresh air inlet contradicts its name and becomes a foul air outlet, and the odors manifest themselves in a disagreeable manner at times, particularly during the Summer, when one is sitting near this opening. The principal objections to a running trap are the fact that it is often the cause of obstructed sewers, due to careless occupants and servants throwing rags, broken bottles, small cans and even scrub brushes and other things into water closets, which get by the fixture trap and lodge in the running trap. A sewer with or without a running trap will not carry off any and everything, but with a running trap a sewer will act properly for years with care, and to my mind the running trap is an additional safeguard to the occupants. It is also contended by its opponents that without the running trap the public sewers would be better ventilated and there would be no sewer gas nor occasion to guard against it if there were nothing to impede the free circulation of air from public sewers up through thousands of vent stacks in building. This is a good, sensible argument where a city is having an entire sewerage system installed and new sewers placed under all houses, but I doubt its wisdom in a city where thousands of running traps are already in place, for there would not be that free circulation of sewer air and gas, except through those sewers where the traps are omitted, and the adjoining neighbors, especially in Summer, would be subjected to the odors, as frequently happens now when one building is higher than the other. Many claim there is no such thing as sewer air or gas, but that is surely a mistake, because it cannot be prevented when chemical laboratory, automobile garage, tanning factories, abattoirs, gas works, etc., discharge their waste, together with household waste, into public sewers; this accumulation of gas is shown when manhole covers are lifted into the air, accompanied by loud explosions, and if there were no sewer gas, why spend money trapping and ventilating plumbing fixtures, as is required in all cities, for this is done to prevent the entrance of public sewer air and that of house sewer into the premises through unsealed traps. The $\frac{1}{4}$ -inch S or P trap

(so named because they are shaped like those two letters) are usually placed under and as close as possible to basins, sinks, and laundry tubs, and have a water seal in the trap of about $1\frac{1}{2}$ inches to $1\frac{3}{4}$ inches. If the trap is unvented the water evaporates and breaks the water seal in about four weeks, and, if vented, in about two weeks, the length of time depending on season of year and temperature. While an unvented trap holds its seal longer than a ventilated trap, when not in use, it can be siphoned by having the water entirely drained out of the trap when some other is discharged or by capillary attraction when lint or hair lies in a trap with one end in the water and the other extended into waste line.

A non-siphon trap has a large body and is so constructed as to prevent entire siphonage of water from the trap, and is self-scouring and without inaccessible hidden partitions is considered a safe trap, as it would take about fifty weeks to evaporate the water from a 3-inch trap with a 4-inch water seal. The use of this trap will considerably cheapen plumbing construction, as no vent pipe is required, and it is allowed in cases where it is difficult to ventilate a fixture trap. This form of trap is used under basins, tubs, dental cuspidors, and other small fixtures. I do not consider it a good trap to be placed under sinks.

Traps on Fixtures.

The water closet trap is moulded within the fixture and is not visible, but its presence is manifested by the large body of water contained in the bowl at all times, some having deeper seals, and consequently a deeper body of water, which is an advantage, as there is less fouling surface in the bowl above the water line.

Ventilation of fixture traps is accomplished by a crown vent, which is rapidly being superseded by the better construction of extending the waste as a vent and by the continuous or circuit system for a number of fixtures. The object in venting each fixture trap is not only to carry off odors, but to provide air to replace that which has been pushed ahead by the column of water discharged from a fixture, to prevent siphonage, which is draining of water from fixture traps, and to prevent back pressure, both of which will break the seal of trap and allow sewer air to enter the premises. When a house has been without a tenant, or has been closed a long time there is always a possibility that serious defects have developed in the plumbing, caused by the opening of joints of soil, waste and vent pipes, due to settlement of the building or difference in temperature, also the evaporation of water from fixture trap is liable to occur, and

shrinkage of washers, and the cutting away of lead traps by rats to obtain water. These defects all endanger the health of the occupants, and no one should occupy a house under the above conditions without having a plumber make a peppermint or smoke test.

Infectious Diseases.

If the house were formerly occupied by persons having infectious diseases the building should be thoroughly fumigated and floors washed with disinfectants.

A recent research for the cause of cancer in France has shown that where one case of cancer was found in a house, other cases followed, and this is possible with other diseases, such as tuberculosis, pneumonia, and children's diseases, unless the house is thoroughly fumigated, as is done in this city.

A case was called to my attention where a tuberculosis patient far advanced with the disease was found expectorating into a kitchen sink. Imagine others using the sink for culinary purposes! I know, of course, the bacilli of tuberculosis are supposed to be transmitted only in dry form, but who can positively say that another case could not be traced to the thoughtless use of the sink by this diseased person? This is only one case of improper use of a kitchen sink, but the average servant can be pointed out as the greatest offender in this respect, because she believes the sink can be used as a slop sink, for getting rid of every possible thing that can be pushed through the strainer, including coffee grounds, particles of fat meat and vegetables, large quantities of grease from baking pans and skillets. This and the soiled water from floor washing are emptied into the sink and sewer in large doses with no thought of the result.

Such refuse should be carefully collected and burned or placed in a garbage pail, for no sewer will continue to do business with such treatment. Grease congeals when cold on the sides of a pipe, above the flow of water, and gradually increases until the entire bore of the pipe is closed, causing an obstruction which in many cases can only be cured by replacing the sewer with new pipe, as was done in a case that came under my observation when seventy-five feet of 4-inch sewer was taken out because it was impossible to remove the grease which had congealed into a hard mass and completely filled the pipe. In this case I saw a pan which had cooled containing grease one inch thick, and the cook told me she intended turning it into the sewer. I felt it my duty to not only tell her not to do so, but also the lady in charge of the institution. Such carelessness is unpardonable, for if a well designed ventilating grease trap, containing a

large body of water having baffle plates is used for hotels, clubs and institutions, and someone is delegated and required to collect the grease daily, enough can be gathered to provide a supply of soap and besides keep the sewer clear.

Obstructed Sewers.

An obstructed sewer is an abomination, because (especially during rain) it backs up and overflows into cellars with all its filthy accumulation, which frequently seeps through walls and into adjoining premises, creating a damp and unhealthy condition likely to bring about sickness and cause a great inconvenience to the occupants, and annoyance from dirt when the plumber begins work to clear the obstruction.

Obstructed sewers are not always caused by grease, but often by obstructions in running trap as mentioned before and by tree roots gaining access to old terra cotta sewers, through the pipe joints, where the cement has broken away. Because of the great number of trees at the curb line in this city, and the fact that most house sewers run to the front, the plumbing regulations here require that cast iron be used for new work and extensions and when replacing more than twelve feet of terra cotta pipe.

Everything deteriorates with age, and systems of plumbing are no exception to this rule, so like everything else they need attention and care, but to the layman a plumbing system, like the human system, is given little attention until at last its vital parts refuse to act.

Many severe cases of illness could be prevented if one but exercised sound judgment with their work, habits, eating and exercise, and the same may be said for a system of plumbing, for no sewer will act properly if the queen of the kitchen empties all sorts of greasy substances into the sink and throws rags and refuse into other fixtures.

Diseases of Plumbing Systems.

Large quantities of greasy food taken into the stomach bring on indigestion and derangements of the bowels, and this same treatment of a sewer brings on indigestion and constipation in the form of obstructed sewers, often accompanied by vomiting (overflow), another ailment brought on by undigested food. This is quite a dangerous symptom and home remedies are of no use, so some kind friend runs for the doctor (the plumber), and the trained nurses (the plumber's helpers), and with all their surgical instruments, such as saw, plunger (or stomach pump), bandages (represented by a pot of lead), and cast iron pipe, which takes the place of splints, proceed with diligence in their automobile (usually a one-horse team or on shank's mares) to the premises

and begin on the patient. Like some doctors, there is an expression of opinion, the stomach pump (plunger) is used, and after giving advice and leaving a prescription the plumber departs to call the next day, or upon an urgent telephone message when the patient is worse. Then it is seen that nothing but a surgical operation will relieve the patient, and doctor and nurses get very busy, which is demonstrated by the great amount of blood (mud and water) the patient loses. Such an operation causes, particularly the women, considerable worry (on account of the dirt tracked through the house), and not infrequently harsh words, when the doctor informs the family there is nothing which will save the patient's life but to cut off the diseased part and graft on a new member. The only difference between the sewer and human life, in such cases, is, the plumber must state what it will cost before beginning the operation; with the physician this is well known later on. The plumber doctor has the same difficulty at times in collecting his fee that the M.D. experiences. I suppose the call of either physician or plumber could have been prevented in many cases by a little care.

The Plumber Doctor.

The vital organs of a plumbing system are adequate water supply (heart and arteries), the sewer or bowels to carry off the waste matter, the ventilation system, which acts as lungs, to convey air through the system. Well arranged and adequate-sized rain leaders do for the sewer what the kidneys do for the human system, flush and cleanse it. Other diseases to which plumbing is subjected are appendicitis (obstructed running trap, which can be removed without injury); constipation, or obstructed sewer; nausea (obstructed overflowing sewer); congestion of the lungs (obstructed vent pipes); offensive breath (when water seal of trap is broken by evaporation); sore throat (defective trap or fixture connection); cancerous growth (tree roots in sewer); diarrhoea (leaking sewer); urinary diseases (defective downspout connections); eczema (rust, scaling of vent pipe and kitchen boilers); asthma (partly obstructed vent stacks); peritonitis (breaking down of terra cotta sewers); ruptured artery (burst water pipe); varicose vein (distention of lead water service due to water hammer), and many other bodily ills, for which a registered plumbing doctor should be called to insure that the work is done properly and not by a sundown plumber physician.

The inspector of plumbing and his assistants are frequently called as consulting physicians in complicated cases of diseased plumbing, and many wrong diagnoses and grave mistakes by young

plumbing doctors have been prevented by the mature experience and advice of an able corps of assistants. The office of the inspector of plumbing is an important and necessary office for all cities where plumbing is installed to protect the property owner against plumbing work being improperly performed. The work of the office force is quietly done and few know the importance of the office or the amount of defective pipe, fittings and work which is condemned and required to be replaced, or the amount of defective plumbing and fixtures required to be replaced by the service of notices on owners when they do not keep the plumbing in proper order.

FATHER WENT HOME.

The little daughter of R. J. Cluff, Toronto, is given credit for the following lines:

Father, dear father, come home with me now,

The clock on the dashboard strikes one!

Don't fuss with the car any longer, papa,

You can't get the old tub to run!

The cylinder's cracked and the timer won't work,

And mother's been waiting since tea,
So tether the car to a post, father dear,
And come home on the trolley with me!

Come home, come home—etc.

Father, dear father, come home with me now,

The speed meter clock's striking two!
The night has grown colder; the rear tire's flat,

And mamma may fret about you.

The cam shaft is twisted, the pump's out of gear;

Perhaps before morning shall dawn,
Ma may grow real angry and want a divorce—

Come quickly, or she may be gone!

Come home, come home—etc.

Father, dear father, fly home with me now,

The clock's striking three—it's struck out!

Don't fool any more with magneto and coil;

The wires have grounded, no doubt!

The child's plea was answered—the answer was short,

Which the night winds repeat as they roam;

The gas tank exploded—some noise and some smoke,

And father and daughter blew home!

We're home, we're home!—etc.

The Ventilation of Schools

Thomas Watson, Sanitary Inspector, Fort William, Ont., Expresses Some Strong Criticism of the Lack of Proper Ventilation in Canadian Schools.

No branch of sanitary science is more in need of consideration than that of supplying our children with the most health-giving element—pure air; and yet so little attention is given to this matter in the designing and construction of our public and other schools that the result is a weakening, or lowering, of the mental faculties not to speak of the physical loss to the attending pupils. Can we afford to ignore any means that would prevent this waste or loss? There is no disputing the fact that Canada is not in the vanguard of progress in looking after the requirements necessary to insure the health of the young. Why should this be so? Not because she is not proud of her schools, or that she has no interest in the development of her children. Is it not rather because she is contentedly confident that her climate is such that it is sufficient to safeguard the health of all her people, whether young or otherwise? Is not the question of climate rather a forcible factor in favor of pausing to consider whether all is being done that might be to preserve the bloom and freshness of youth? With all the extremes of temperature our climate is invigorating, but we are treating of indoor conditions. There are practically no congested areas, or confined manufacturing centres, to contaminate to any appreciable degree the air of our land.

School Ventilation Neglected.

Our laws are such that provision has been made to protect and care for the health of employes in factories, workshops and places of public assembly. Houses, schools, churches, steamboats and railway cars are all specified as coming under the care of authorities whose duty it is to see to their healthful condition. Why, then, this need for taking into account school ventilation? That there is room for improvement is patent from the number of complaints made to school and health authorities—complaints of headaches, eye troubles and general enervation. If it is the ventilation at fault who is to blame, and how are authorities to be stirred to a sense of their responsibilities? Health boards may agree as to the cause, and may advise educational boards as to the remedy, but how often do they insist on its application? Some such excuse as lack of funds or a difference

of opinion as to methods is put forth, with the result that nothing is done to abolish what is poisoning the life-blood of the suffering children.

Let us consider our school-rooms and the systems in use in providing the air pupils have to breathe as the "food of life." Almost without exception there is no provision for the entrance of fresh air, and where provision is made, it is introduced at a height where it is polluted by products of respiration, and brought to the breathing level so diluted as to rob it of all health-supplying properties. There is practically no attempt at ventilation apart and separate from heating, and the result is that heating, being a problem of much easier solution than that of good ventilation, receives all attention, and ventilation is made subsidiary to it. We have yet in many of our schools the wood and coal furnace, from the chambers of which is passed the air, often superheated, that is all the children have in which to prosecute their studies. Is there any wonder that complaints should be made of lassitude, when pupils have to breathe for hours at a time an atmosphere which is so deficient in oxygen and is rendered more poisonous by the effete organic matters from their bodies and lungs? Other and better systems there are, but almost all are on the down-draught principle, a system which not only prevents the carrying off of the foul products as they are generated, but compels the re-breathing of air which has been already expelled. This system is largely to blame in the spread, to epidemic form, of such infectious diseases as measles and scarlet fever.

Natural System Best.

What system, then, can be adopted to remedy the evils pointed out, and supply pure air without creating dangerous draughts? It will be readily recognized that during the warm months of summer almost any system will be reversed, either because the outside air will be warmer than that of the school-room, or because the mechanical forces have no motive power to work them. We may safely then let the summer months' air supply care for itself, or, in other words, natural forces will suffice. In winter it is different, as it is

then we have the greater need for ventilation.

Let the system be a natural one, that is, a supply of fresh (not necessarily cold) air be admitted from a pure source in a free and natural flow without force. Outlets and inlets will regulate the supply and temperature will determine the velocity. Fewer obstacles have to be overcome, and there is less liability of draught. Perhaps the most popular argument in favor of the adoption of this system is that of cost. It is cheaper to instal, costless in operation, and constant in service. Whether the system be natural or artificial, there is a crying need for a purer atmosphere in all our schools.

COST OF BUILDING LOWER.

The cost of building has now been substantially reduced by a number of causes. Steel and iron have gone down, and, generally speaking, lumber is being sold for 10 to 12 per cent. less than a year ago. General contractors are willing to take less profit than at any time within the last few years and sub-contractors are taking work at figures to serve little else than to hold their working organization together. Although wages for labor are nominally the same, competition among mechanics to hold their places renders the labor better, and, therefore, cheaper. From the American Lumberman is taken the following comparison of prices for building in 1907-08 representing actual figures obtained by a party who wished to build:

	1907.	1908.	p.c. of decrease.
Masonry and grading ..	\$1,329	\$944	29.0
Plastering ..	585	313	46.8
Plumbing ..	640	500	21.9
Heating ...	730	570	22.0
Painting ...	530	400	24.5

Lumber \$4 to \$6, a thousand less.

The 1907 prices were made during the latter part of that year and the 1908 prices during June.

The contract for installing Oakville's waterworks system has been awarded to Mogk & Co., Waterloo, Ont., and already a large gang of men are at work excavating for the power house and water tower. The whole system is to be completed by December 15.

Care of Domestic Heating Apparatus

Suggestions Made by C. E. Oldacre Regarding the Management of House Heating Systems During Summer and Winter Months—A Subject of Live Interest at the Present Time.

No one subject receives much greater attention at the hands of the householder during the colder months of the year than does that of heating apparatus, and the results to be had in their use.

And right justly is this attention given, as to a great extent our bodily comfort is dependent on artificial heat during a considerable portion of the year. The more dependable the apparatus and the more responsive to our needs the greater is the comfort derived.

The greater proportion of our homes to-day are provided with some form of heating apparatus—warm air, steam, or hot water.

These methods of heating are to be found in many modified forms—warm air, and warm air and hot water combination, direct hot water, direct steam, direct-indirect steam, direct-indirect hot water, indirect steam and indirect hot water. Further, in some cases the indirect methods of hot water and steam may be combined with the direct—that is a portion of the house may be heated by the indirect method and a portion by the direct—all the radiators being connected with one central heater or boiler.

Merits of Different Systems.

No one system is necessarily the most applicable or the best method in all cases, but it follows of course, that whatever the method chosen, the better it is installed, the better the attention it receives, and the better the care it gets when out of use, the better are the results that are obtained and the more economical is the operation of the heating plant.

Without reference to any specific kind of apparatus or make of apparatus there are certain points that should be observed in the care and operation of heating apparatus to obtain reasonable results.

A heater or boiler consists essentially of an ashpit, fire box, combustion chamber, flue space, together with an air inlet, smoke outlet and grate or grates.

A chimney having a good draft is absolutely necessary to the proper operation of any heater. It should be, generally speaking, as straight as possible without offsets or bends, and be of a uniform size throughout. The minimum size should not be less than 9 inches by 9 inches for houses having up to 12

rooms in the average house, and may be 9 inches by 13 inches, or larger, in proportion to the size of the house for larger houses. There should be only two openings into the chimney one near the base for the connection of the smoke pipe and one at the top, together with a clean-out opening at the base having a tightly-fitting cover. No chimney should have more than one stove, range, heater, boiler or fireplace connected to it—each being connected to a separate flue. A non-observance of this one condition is likely to be a very fruitful source of dissatisfaction and annoyance.

Chimney Often to Blame.

Many desirable patterns and forms of stoves, heaters and ranges have been condemned by their owners for no other reason than that the chimney was faulty in one or more details. A great many people for some reason or other seem to believe that a good draft is a part of the heating or cooking apparatus, but such is in no way the case, as everything is practically dependent on the chimney and nothing but the chimney. Regardless of whether the apparatus is otherwise satisfactory in its operation if the fire does not burn reasonably well it can at once be set down that it is no fault of the heater, stove or range, no matter how simple it may be in its construction, no matter how expensive or inexpensive it may be.

To many, a draft, good, bad or indifferent, is an inherent feature incorporated with every form of apparatus in which fuel is burned. But the form or type of construction usually to be found has little or nothing to do with the draft.

There is one class of difficulties met with by the man in the heating business that might well be spoken of here and that is the case where a heating apparatus (and the same applies equally as well to stoves and ranges) is installed in an old house where wood has heretofore been the fuel used. In such places the chimney may be only one that is 4 inches by 8 inches and it has worked well with wood, but when an apparatus using coal is placed in position the draft is entirely unsatisfactory and consequently the results are poor. The trouble here is not only due to the size of the chimney, but it is likely that the chimney is in an outside wall and there are several openings into that chimney

that have been used for small stoves. There is only one cure for such trouble and that is, have a proper chimney built that is to be used independently for the heating apparatus and there will be no further complaint on the score of poor draft.

A chimney that ensures a fair draft should be so built, that it is of full area throughout its entire course, has no communication with any other flue in any way, is carried higher than any nearby roof, and is not overhung by limbs of any surrounding trees. The chimney is the breathing-pipe for any stove, range, heater, furnace or boiler and it does not want to be choked permanently at any point—if it is, good results can not be had.

In general an observance of the following in the operation and care of heating apparatus may be found of value.

Building the Fire.

See that the smoke pipe is tightly connected to the chimney and is clear of dirt—that the tight damper is open, that is the damper that is usually placed in the smoke pipe—that any slide damper is pulled out that is in line with the direct draft—that all openings in the smoke pipe or chimney are closed including any check dampers. If there is a direct and indirect draft that the direct draft damper is wide open to the flue.

See that the grates are clear and operate freely. Put in plenty of dry kindling, paper first (or shavings) and small wood afterwards, then the larger pieces of wood or gas-house coke. Light the fire from the bottom and get a well lighted fire before adding coal. While starting fire with light fuel do not open the draft dampers located below the grates too wide as it is liable to cause smoke to be thrown out into the cellar. Throwing kerosene, or coal oil on the kindling is unnecessary and may be dangerous. Only add the coal after the fire has got well started and has had time to burn evenly all over the grate. If there seems to be a tendency to a sluggish draft place one or two goodly sized papers in base of flue and light so as to heat the chimney as it may be damp, and if necessary this may be repeated once or twice.

Maintaining the Fire.

After the fire is well started have the firepot well filled up to the bottom

of the feeder door—don't try operating with a shallow fire—there is no economy in trying to do so even if you might think that only a little coal in the firepot means little coal burned. Regulate the rate of consumption by the dampers. The greatest amount of fuel can be burned by having the draft damper below the grate open (or the ashpit door open) the revolving damper in the smoke pipe open the check draft (or opening in smoke pipe) closed as also the feeder door and the least when the reverse is the case.

To lower the intensity of the fire—first close the draft doors below the line of the grates—then partly close the revolving damper in smoke pipe—then open the check damper that opens into the smoke pipe.

These successive steps will each reduce the rate of combustion and cause less heat to be given off by the apparatus.

Shaking the Grates.

In shaking or operating the grates always see that they are returned to their normal position. If of the revolving type always see that the upper part is flat and that the points do not extend up into the fire.

When shaking see that the revolving damper in smoke pipe is wide open and that the ash-pit door and slides in door are closed as is also the check damper.

Removal of Ashes.

It is a safe policy, to avoid warping and burning out of grates to remove all ashes from the ashpit each time the grates are shaken. All ashes should be removed not less than once a day from the ashpit. Non-observance of this is liable to cause the ashes to become banked up against the underneath side of the grates and cause damage. In ninety-nine cases out of a hundred this is the entire cause of trouble with grates, as the grates usually found are heavy enough to stand the usual wear and tear without any damage. See that back of ashpit is kept clear.

Special Care for Mild Weather.

Let the ashes accumulate on top of the grates so there may be a more or less depth of ashes on the grates according to the weather. Keep the fire line or coal supply up to the bottom of the feed door and don't try to operate with a shallow fire and with the feed door open. Keep the revolving damper in smoke pipe just sufficiently open to carry off all gas and check further with the check draft opening into the smoke when absolutely necessary. Do not shut off the revolving damper too much and at the same time open the check damper. The revolving damper (or slide damper) should have one or two openings of not

less than a total area of 2 inches or if a slide damper is used then there should be a stop that prevents the slide from being entirely closed.

Special Care for Cold Weather.

The clearer the fire is kept at the bottom and the less the amount of ashes on the grates, the greater is the amount of heat that can be had. During cold weather the fire will need be shaken down twice a day and if severe weather prevails probably three times.

If the draft is a good one it will hardly be necessary to leave the draft doors below the grate line open for a period to exceed 15 or 20 minutes to get the new fuel properly caught up (or lighted.) Leaving the drafts turned on too long will most likely burn out the fuel too much, and temporarily over-heat the house and put the fire in such a condition that it will not carry over for a sufficient length of time. Keep the firepot full of coal up to bottom of feeder door.

Morning Care.

As of course during the night the fire has received no attention the fire may be pretty well burned out, particularly during cold or windy weather. First close the check draft, open the revolving damper wide and open the lower draft doors, and add two or three shovelfuls of coal or more, according to the size of heater, and allow the fire to burn up fairly well. Do not shake at first. This will quickly warm up the house and then after the breakfast hour is over shake the fire down according to the weather and add the fuel for the day, closing the revolving damper and opening the check damper (if necessary) as soon as fire is burning well. See that sufficient coal is added to fully fill the firepot up to the bottom of feeder door. Do not allow any direct damper to be open too long or the draft doors at bottom of furnace to be left open so long that the fire will burn out too much.

Evening Care.

Shake down the fire as late as convenient, according to the weather conditions and add coal to fill the firepot full to the bottom of feeder door. Don't open the lower draft doors unless really necessary and when the fire is fairly caught up close the revolving damper partly (more or less according to the intensity of the draft) and open the check damper which opens directly into the smoke pipe, setting this check damper more or less open as experience in each particular case can only teach you, and a fairly satisfactory temperature should be maintained throughout the night, and the fire should be in such condition in the morning that a good temperature should be had reasonably

soon after the proper morning attention has been given the heater.

General Observances.

Don't burn paper, rubbish or garbage in your heater. See that the ashes are removed at least daily from the heater ashpit, both in mild weather and cold weather.

Grates are burned out and warped by letting the ashes accumulate in the ashpit.

Don't check your fire by opening the feeder door any more than absolutely necessary.

Don't open the feeder door wide open and close the revolving damper in the smoke pipe or open the check draft at the same time.

Don't think you have a good fire because it looks bright on the top, because there may be several inches of ashes between the fire and the grate.

If you want a clear fire be sure the fire is bright all over the bottom of the fire. A good look through the ashpit door will show you this.

Don't think the ashpit is clear of ashes because it has been swept in front—there may be more ashes at the back of ashpit.

When the feeder door is open for the purpose of adding new fuel, see that the turn or revolving damper is open and that the check draft is closed, and it is well to have the draft doors at the bottom closed as well.

Don't leave the feeder door open any longer than really necessary.

A slide damper with a stop preventing it being entirely closed, and a revolving damper with one or two holes having an area of not less than 2 inches serves the same purpose.

Don't shake the grates any more than really necessary in mild weather and in cold weather shake them often enough to get a clear fire two or three times a day.

Keep the firepot full up to the bottom of feed door to get best results at all times.

Take note of, and put in practice, the particular little attentions you may need give your heater to get the very best results.

Hot Air Furnaces.

Before lighting the fire see that all dampers in the heat pipes are open.

If heat is not wanted in upper rooms close the dampers partly in flues leading to such rooms after the fire is properly started.

Don't close all the registers or all the dampers in the heat pipes when a fire is in the furnace.

If any one pipe is slow in starting shut off the pipes at the furnace which

(Continued on page 15).

Radiators and Boiler on Same Level

J. P. Lisk, M.E., Describes an Odd Heating System at Troy in the Engineering Review.

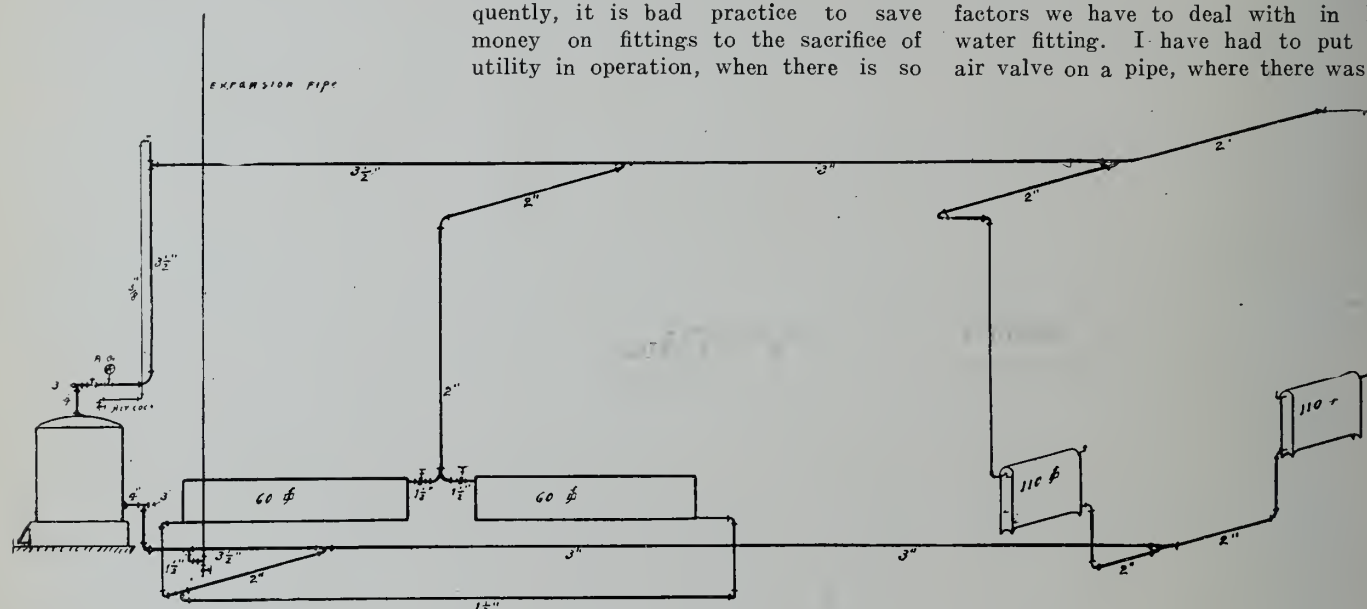
To men well advanced in the knowledge of the science of hot water heating, the installation of systems with the radiation below the boiler, and combinations, with some radiation above and some below, are not unfamiliar or novel. But, to the great majority of steam fitters, such a system as I have shown (it has now been working two Winters with entire satisfaction and good economy), is a decided novelty. They may not be easily convinced that work done after this plan will be a success. However, the fact is that, with the exercise of a little forethought

amply large enough to make an appreciable difference in the estimate, and if you cannot get enough money for an installation to do it as it should be done you had better let the other man do it.

Second: Avoid short radius fittings; water does not turn short corners readily, the velocity of flow is greatly reduced, and as the flow is produced by the difference in weight between the outgoing and returning water, due to the loss of temperature in the radiators, it may be readily understood that in an ordinary two-storey dwelling the motive force is not a large quantity. Consequently, it is bad practice to save money on fittings to the sacrifice of utility in operation, when there is so

1½ inches and one 2 inches, joining a 2½-inch pipe, the 2-inch pipe returning from the first floor radiation and the 1½-inch pipe from the third floor radiation, we would naturally have a very high velocity in the 1½-inch pipe as compared to the velocity in the 2-inch pipe. If these pipes butted in a 2-inch x 1½-inch x 2½-inch "tee" the return from the first floor radiation would be materially affected, if not blocked off altogether.

Fifth: Locate air valves so that all air may be removed from the system, as air is one of the most troublesome factors we have to deal with in hot water fitting. I have had to put an air valve on a pipe, where there was an



Hot Water Heating System with Radiators and Boiler on the Same Level.

regarding the principles of circulation of water in a heating system, almost any fitter can reason from cause to effect, and finally decide that if he does not arrange combinations of piping that defy natural laws, he can instal hot water systems with the boiler in the attic, providing it would be convenient to have it there, and in a great many cities located on the sides of hills, or mountains, where houses are two storeys on the street side and four storeys above the back yard, such arrangements are absolutely necessary. Now, I will briefly describe some of the things that should be carefully planned and carried out in this class of work.

Some Points to Remember.

First: Do not make the pipes too small. There is not enough difference in the cost between pipes that are almost large enough and pipes that are

little difference in the cost of long and short radius fittings.

Third: Be careful about the pitch of the pipes. Make all grades uniform, also take care that pipes are straightened before erection. This will reduce the possibility of air pockets in the straight runs. I have frequently found on a 30-foot run, a pocket of one and one-half times the diameter of the pipe, which had a very detrimental effect on the radiation on that line.

Fourth: Avoid butting the return lines. This is a frequent fault in hot water fitting, and I have been asked many times by fairly good fitters what difference it made if the pipes lead into one of relative area. The fact is that relative areas do not solve the problem. Velocity has a great deal more to do with the matter than areas. As an example, if we have two pipes, one

unavoidable air pocket, before I could get the job to circulate properly. Provision for removing the air from a large system requires considerable study on the part of a designer and its importance should never be underestimated if trouble in operation is to be avoided.

Sixth: The connection of the expansion tank should be made to the lowest point in the system, as shown by the drawing, as this avoids all possibility of boiling over, which frequently happens when it is connected to a radiator at the highest point. The size of the expansion pipe should not be less than 1 inch in diameter for systems up to 1,500 square feet of radiation.

Seventh: When indirect radiation is included in the layout, the best results are obtained when it is put on a separate system of mains, as the work required of an indirect is radically dif-

ferent from the direct radiation. Greater differences of temperature maintain, and, while the height of the motive column is not so great, still the velocity of flow is greater, due to the greater difference in temperature; therefore, it is a very difficult matter to balance the two systems of radiation on one set of mains, and while it is sometimes done, it is more accident than intention.

Boiler Higher Than Radiator.

The accompanying plan shows the system hereinbefore mentioned, which is a small installation in the cafe at Troy, N.Y. The boiler is in the rear of the building and approximately 3 feet 6 inches above the radiation. The main flow pipe rises from the top of the boiler about 4 feet, then makes a right angle turn, passing through the wall, where it makes another right angle turn and rises about 6 feet to a point near the ceiling where it runs along to points opposite the radiators, distributing to same through suitable size drop branches. From the bottom of the radiators the outlets are carried down through the floor to the main return pipe, where they are gathered together and led to a point near the boiler, then rise through the floor and are connected as shown.

One particular feature I wish to call attention to is the way the air is taken from the main by the $\frac{3}{4}$ -inch drop pipe. This way of arranging it insured a system full of solid water, and it also brought the air cock down where it could be manipulated. The method of attaching the expansion tanks is also clearly shown. The tank was in the third storey of the building, consequently the system was under considerable pressure, about 15 pounds, which allowed a temperature of the water considerably greater than the boiling point. Of course, this is a great advantage in extremely cold weather. However, the installation has never been required to work above the normal boiler temperature of 180 degrees F. It will be noticed, by referring to the plan, that outlets have been left in the flow and return pipes near the boiler. These outlets are for future use when the entire building will be heated. The two 60 square feet radiators are wall radiators, and the two 110 square feet are three columns 32-inch high pattern radiators. The foregoing description and general remarks, make notes, etc., on plan, except dimension of radiators and pipe sizes, unnecessary. Therefore I have omitted, for the sake of clearness, notes that make a working plan so valuable to the erecting man, in the absence of a specification.

I mentioned something about pipe sizes. I now go a little deeper into that most necessary subject, and submit this table which if used will insure suc-

cess as the sizes here given are guaranteed by the author. I have demonstrated by actual practice that these sizes are reasonably correct, for service, and from the estimator's point of view, which is that of securing the contract at a reasonable profit. This table is based on a maximum of 150-foot runs with the usual number of turns, valves, etc., found in ordinary work.

Square Feet of Direct Radiating Surface Supplied with Steam of One Pound Gauge Pressure.

Pipe Size	Two Pipe System for Steam	One Pipe System for Steam	Hot Water System. Water at 180 in Boiler
$\frac{3}{4}$ "	21	18	17
1"	36	32	29
$1\frac{1}{4}$ "	90	79	72
$1\frac{1}{2}$ "	130	115	104
2"	225	198	180
$2\frac{1}{2}$ "	510	450	408
3"	730	640	584
$3\frac{1}{2}$ "	1000	880	800
4"	1600	1410	1280
5"	2500	2200	2000
6"	4200	3700	3360
7"	7100	6250	5680
8"	9300	8200	7440
9"	12200	11725	9760
10"	15700	13800	12560
12"	22600	19900	18080

CARE OF DOMESTIC HEATING APPARATUS.

(Concluded from page 13).

are attached to furnace close to this particular pipe for a few minutes.

Don't close off the fresh air duct leading from outside to the base of heater entirely, but see that it is properly regulated according to the velocity of the wind and the outside temperature. The damper in the fresh air duct may be closed partly at night during the cold weather, but should be wide open or nearly so during the day except during severe winds.

If your furnace has a dust damper don't leave it open if you want the fire to burn up.

Hot Water Heaters.

Before lighting the fire see that the system is filled with water—that is, that there is a half a gauge of water showing in the expansion tank.

Keep the pipes and radiators filled with water during the summer as well as during the winter.

During the heating season see that the tank shows water in the gauge glass.

Don't draw off water from the radiators or the boiler for domestic purposes.

Occasionally open the air vents to let off any accumulated air and as soon as water appears at the vent close it.

Try and keep a fairly uniform fire according to the weather.

Drawing the water off completely once or twice after the completion of a new heating plant is wise to get rid of all dirt and cuttings, but afterwards it is best to leave it filled, gradually adding water as required.

Have the heater well covered with asbestos plaster not less than $1\frac{1}{4}$ or $1\frac{1}{2}$ inches thick. It saves the fuel.

Don't empty the system when a fire is in the heater, and do not fill it, if the system is empty, when a fire is in the boiler.

Keep the firepot full up to the bottom of feeder door to get best results.

Steam Boilers.

Before lighting the fire see that there is a half gauge of water showing in the gauge glass. See the gauge glass is clear and that the valves leading from boiler to gauge glass are open.

One or two pounds of steam as shown on the gauge is all that is necessary under ordinary conditions to get the proper results from a low pressure heating plant.

See that the chains leading to the check damper and draft damper are properly adjusted and in working order.

See that the safety valve on the boiler is in proper working order and that it is properly set.

All air valves should be properly adjusted so that as soon as steam is on the radiator, they will tightly close.

When the ordinary low pressure system is used all steam valves on radiators should be wide open if heat is desired and tightly closed if heat is not desired. Don't have them half open or half closed.

Have the boiler well covered with asbestos plaster not less than $1\frac{1}{4}$ or $1\frac{1}{2}$ inches thick. It saves the fuel.

Summer Care of Apparatus.

As soon as fire is out take down the smoke pipe and clean out thoroughly and then put away in dry place till needed in the fall.

Clean out the heater thoroughly, removing all ashes, dirt and soot with wire or other suitable brush.

Don't leave off cleaning the heater till it is wanted in the fall. More wear is on the heater in the summer if it is left filled with the accumulated soot and dirt than there is in the winter when the heater is actually in use.

If your heater has been in use for some time and there are any worn or broken parts look the heater over and get the parts replaced as soon as possible. Don't put it off till the heater will be actually needed for the coming season.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

HEATING SYSTEM UNSATISFACTORY.

G. H. Barr, barrister, Regina, sends the following inquiry:

I have been referred to you by one of the firms of our city as a reliable source of information in regard to heating plants.

I have a very expensive hot-water heating plant in my house, and for some reason or other, it is not giving satisfaction. The main difficulty seems to be in the flow of the hot water through the pipes. The following are facts which appear to me to be sufficient to give you some idea of the particulars necessary to form your conclusion:

My house is 42 feet 6 inches by 26 feet 6 inches; height of ceilings, down stairs, 9 feet 6 inches; up stairs, 8 feet 9 inches; it is solid brick, back plastered and lined, with two air spaces.

The boiler has a capacity, allowing for radiation in the basement, of 1,200 square feet. There is provision on the boiler for 9 two-inch mains, but the parties who put in my plant have only run 4 of these mains, plugging up the other holes. They seem to think that this is sufficient.

From these mains there are 9 one-inch risers and 8 one and a quarter-inch risers. As I make it up, the area of the mains is about 12 square inches, and that of the risers about 17 square inches.

I understand from Armstrong, Smith & Dowswell, a local firm here, who are subscribers to your paper, that you take up and discuss matters of this kind, and if such be the case, I would be very pleased to hear from you as to what may be the difficulty in connection with my plant.

I might just add that it seems to take a long while to get the house warmed, although I have a roaring fire in the furnace, it would be some two or three hours before the rooms are at all comfortable.

Incomplete Information.

The information furnished by our correspondent is not adequate enough to furnish an exact clue to just what might be the trouble with his heating plant.

With a boiler of the size given it is not likely there would be any particular need for 9 2-inch outlets, except that they might be there in that number to facilitate running of the mains in the most convenient manner—allowing of a choice of a certain number with the idea that those not required would be plugged.

At the most 4 or 5 two-inch mains would be all that would ever ordinarily be required on a boiler of the size given.

It would hardly be fair to criticize on the information given either favorably or adversely the system of piping, as much depends on the way the piping is proportioned, as well as erected. Also quite a little depends on the length of runs and the connections used.

From what our correspondent says it might seem that either the piping in the mains did not have sufficient pitch or that the amount of radiation (on which point no information has been given) was not sufficient.

If the heating plant as now installed is capable of at all heating the house it is possible the attention given the apparatus is not sufficient to warrant reasonable results at all times.

If our correspondent could give us information along the following lines we would be pleased to try and point out what most likely might be the difficulties with the heating apparatus in question, viz.:

- Plan of house.
- Number and size of windows. State if windows are double.
- What is the size of chimney? Is it used for boiler only? Does it extend above highest point of roof?
- Plan of piping.
- Size of various rooms.
- Size of various mains.
- Size of various branches.
- Size and location of radiators.
- Diameter of boiler grate.
- Coal burnt per season.
- Number of months boiler is fired.
- Kind of coal used.
- Number of times a day fire attended to.

Are boiler and basement mains covered? If so, how?

Lowest outside temperature.

Inside temperature of each room during any stated outside temperature.

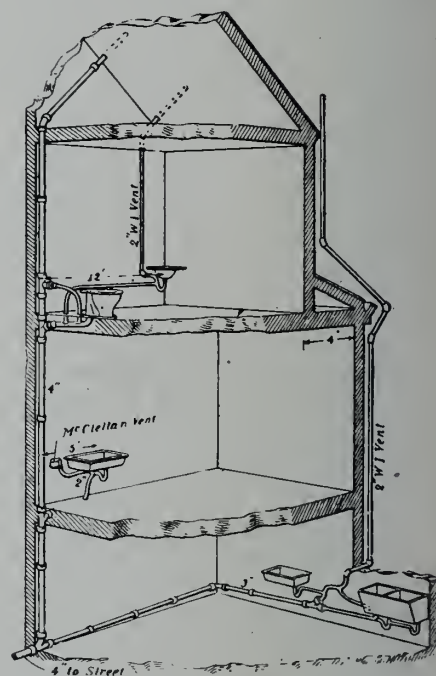
Temperature water at boiler.

Any other information along such lines as are suggested will greatly assist in locating the trouble.

PLUMBING SPOILED BY REGULATIONS.

A very neat job of plumbing is shown in the accompanying illustration, but, points out W. E. Partridge, in the Metal Worker, on account of absurd city regulations, it is not by any means as safe as it might have been. The work consisted of kitchen fixtures in the base-

ment kitchen, with tubs for the laundry on the same floor, a butler's pantry on the floor above, and on the third floor a bathroom, with tub, closet and washbasin. The original house drain was 3 ins. in diameter, but from the point where the soil pipe came in it had to be enlarged to 4 ins. The kitchen sink and washtrays being some 16 or 17 feet from the vertical line and having a right angle in their discharge pipe, could not, according to rules, be vented by a MacClellan vent. Consequently it was necessary to put in a 2-in. wrought iron vent pipe. This pipe rose 4 feet along the basement wall, went through the wall horizontally, went up to the eaves of an extension, and then rose to the roof of the main building. This arrangement was exceedingly foolish. While it was perfectly satisfactory to the inspector, and complied exactly with the regu-



Plumbing Job Spoiled by Regulations.

lations it defeated its own ends completely. The vertical portions of the pipe will scale rapidly, and this scale falling to the bottom of the pipe probably within a year's time choked the pipe.

The main waste stack was of extra heavy 4-in. pipe, and the only place found for it was behind a door which opened near a window. The big awkward pipe was very much in the way, and the door could be opened but a little more than half way. A 3-in. pipe would have gone into the space, and its presence would hardly have been noticed.

The upper parts of both the soil pipe and the 2-in. vent, where they went through the roof, were inclined at an angle of 45 degrees, bringing them through the roof at right angles to the surface. The 2-in. vent from the upper

Coal Sold on New Basis

Quality Instead of Quantity to Be the Basis of Future Sales of Pittsburg Coal—
Heat Units to Be the Test of Value.

washbasin was demanded because the basin was situated 9 feet away from the vertical line. This was a useless piece of work, and involved the complete stoppage of the vent after a few months' use.

In the butler's pantry a MacClellan vent was permitted because the trap was about 4 or 5 feet away from the vertical line.

The arrangement of the plumbing fixtures throughout was very good, and the workmanship was of the best. The senseless following of New York rules and regulations deprived the system, however, entirely of ventilation after it had been in operation for a year or two. This is a fine illustration of the ignorant manner in which Boards of Health all over the country have senselessly followed New York City plumbing regulations.

ASHLEY SEWAGE DISPOSAL SYSTEM.

A large 24-page catalogue and a 12-page booklet have been received from the Ashley Sewage Disposal System, 6515 Normal Boulevard, Chicago. The larger book is well illustrated, showing the method of installing the septic tank and nitrification duct or bacteria bed of the Ashley system. The working is also explained and examples given of where the system has been used. The smaller booklet is also a valuable treatise on sewage disposal. Readers of Plumber and Steamfitter can secure copies on request by mentioning this paper.

SEWAGE PUMPING

Automatic sewage pumping by electrically driven centrifugal pumps has been adopted at Dayton, Ohio. The Great Miami River, on which the city is situated, is subject to heavy floods and levees have been built to protect the city from inundation. During high water, it is necessary to close the gates on the outfall sewers and to pump the sewage into the river. There are now three stations for the purpose. The first station contains two 2,500-gal. pumps geared to 20-h.p. motors, the second contains three 4,500-gal. pumps direct connected to 40-h.p. motors, and the third contains two similar units. At each station apparatus is provided for starting and stopping the units automatically when the sewage rises or falls below certain elevations in the pump chambers.

The B.C. Permanent Loan & Savings Company, which has been constructing largely at Vancouver will erect a six-storey structure opposite its three-storey building just completed. It was originally intended to make this three-storeys in height. The cost will be \$150 000.

Marketing of Pittsburg coal will be revolutionized when plans now being perfected are carried into operation. Instead of basing the price on weight it will be based on the actual heat units the coal will produce. By this system it is believed it will take precedence over the coal of Ohio, Indiana and Illinois, and will command the price its excellence deserves.

The change is based on chemical analysis with the British thermal heat unit as the basis. It is a well determined fact that there is no guaranty for coal other than that determined by the heat units it will produce. A ton of 2,000 pounds may contain so much foreign matter that its usefulness for heat production is materially decreased when compared with a ton whose heat units are far above it. Different cars of coal from the same mine may vary in efficiency as a producer of heat, but as a general proposition the coal from a given mine may be depended upon to make practically the same showing.

This, however, is not true of different fields. The coal which lies between the Youghiogheny and Monongahela Rivers is regarded as the best coal in the Pittsburg district, while that extending to the west of Pittsburg does not have the same heat producing qualities.

Analysis of river coal, as it is known, by the Carnegie Tech shows 14,000 to 14,700 British thermal units, which gives it a commanding place in the market when contracts are based on actual value rather than upon the general knowledge that Pittsburg coal is good coal. There have been mines in the district mentioned where the British thermal units show 15,000, but this is not general, and, therefore, is not taken as a basis.

Use 13,000 as a Base.

For the sake of convenience Pittsburg operators are using 13,000 as a base and figure up or down from that, because at that point the value of coal is \$2 when coal is selling at \$2. This is also the grade of coal underlying Greene County, and when the new system of marketing the product of the mines to be opened in that section is inaugurated its value will be greatly enhanced, because of the premium it will have in the market over other competing coals.

As the coal measures of this section are traced westward the thermal units decrease steadily, although under the present system of marketing the product coals of Ohio, Indiana and Illinois are selling on almost the same basis as Pittsburg coal. Against the 13,000 and more thermal units of the river coal country Ohio districts show no more than from 11,500 to 12,500, practically taking away competition from those consuming interests which desire quality and do not care to pay freight on such waste matter as these coals contain.

Indiana is even worse, with a range of 12,139 to 11,061, while Illinois shows a range of 12,000 to 9,000 units. Yet these coals are selling in the market for practically the same price as Pittsburg river coal, when they should, under the graded system, bring from 40 to 50 cents a ton less.

It is the purpose of the local operators to follow the new order of things so they may receive the real value for what they market.

The Federal Government has been using the graded system for some time, and several local corporations have recently placed it in operation. They want only such coal as will give them the desired heat units.

Under the old order, and in many instances under the existing order, superior coal is brought into competition with inferior coal. The buyer looks to the advantage to be gained by length of haul from the mines to the point of consumption, not considering that if the coal is not equal to or above the standard of 13,000 British thermal units he is paying for ash and moisture which do not enter into the making of steam. In this way Pittsburg operators have not only been deprived of trade, but they have been compelled to accept contracts at prices which they knew were below the value of their coal.

Railroads Adopt System.

In this connection it is stated that some of the more progressive railroads, particularly those operating throughout the West, have come to Pittsburg for coal because they are unwilling to use coal of low standard, such as that found beyond the Mississippi. Anthracite coal is listed as the highest in quality because of its heat-producing qualities, but anthracite sells so far above bituminous coal that the best grade of the latter is more economical for railroad use.

The government is very careful to have its coal of high standard and tests each carload by the number of British thermal units it contains. If the coal falls below the standard set it is rejected, there being no qualification by which it can be taken at a lower price. This is particularly true of coal used in the navy and for the Panama Canal, as the government will not carry a lot of foreign matter which will not produce heat.

The Treasury Department has been purchasing coal on a heat value basis for several years with the most satisfactory results ever obtained. Other instances can be cited where heavy consumers buy coal by tested quality rather than by the ton, and are willing to pay for anything over the standard.

The movement for the introduction of this system in the Pittsburg district is now well under way, and operators predict that it will not be long until they are receiving a higher price for their coal.

NEWS OF THE TRADE IN CANADA

Samuel A. Wye, plumber, Nelson, B. C., has sold his business to Smith & Hunden.

A curator has been appointed for the plumbing business of Louis Gladu, Montreal.

Archibald Bros. have the tender for plumbing in the new fire hall at New Westminster.

Lewis Legrow, 50 Harbord St., Toronto, is around again after an attack of pneumonia.

Gentle & Travis, steamfitters, Toronto, have moved from 30 Richmond St. east to 617 Parliament St.

Cotter Bros., Winnipeg, have been awarded the contract for heating and ventilating the Mulvey School, at a cost of \$11,963.

Curators have been appointed for Philip Lahee, electrical contractor, Montreal, and Philip Lahee & Co. have been registered to take over the business.

Frank Rogers has decided to go into the plumbing and gas fitting business in Blenheim, coincident with the arrival of natural gas. He will open a shop shortly.

R. J. G. Sutherland, Peterboro', has been awarded the contract for the installation of a hot water heating system in the Children's Shelter on the old Hilliard property.

Wallaceburg has no less than three gas supply stores, and all are busy. M. Ullmer, who has been engaged on the pipe line from the gas fields, is the latest to start in business.

Welbanks & Lacroix, Prince Albert, Sask., were the successful tenderers for the plumbing and heating of the new Collegiate Institute at that place. The tender amounted to \$10,500.

G. & E. Blake have been awarded the contract for the heating and plumbing of the new Seaman's Institute Building, St. John, N.B. The work is to be completed by the end of this month.

A skunk invaded the cellar of a well-known master plumber on Queen St. west, Toronto, last week and when the apprentice saw it he pursued the "cat" with a piece of three-quarter inch pipe. He got it—and it got him.

Thos. Lockhart, Galt, has been awarded the contract for the installation of a heating system in the Royal Alexandra private hospital at Elora. This contract was secured in competition with plumbers from other towns in the county.

The Canadian Brass Company, Galt, is working overtime in order to fill the many orders. Having successfully weathered its recent financial difficulties, this firm promises to become one of the town's most flourishing industries.

The Canadian Pipe Company, Vancouver, has obtained an order from

the Fraser River Lumber Company for the supply of about 22,000 feet of wire-wound wood pipe to be used for the installation of a fire protective system at Fraser Mills.

M. D. Tillman, of the Honeywell Heating Specialty Co. Wabash, who is representing the firm's interests in Canada at Montreal, is leaving shortly to visit the head office. On his way he will stop at New York, Philadelphia and points in Virginia.

Marjory B. Robertson, daughter of James M. Robertson, vice-president of the Thomas Robertson Co., Montreal, was knocked down by a train near the country residence of the family at Pointe Claire, and was so severely injured that she died at the Montreal General Hospital soon after admittance.

The prevention of the spread of disease in some forms by the use of the earth closet and other information in reference to the seasonable prevalence of communicable diseases make the August bulletin of the Michigan State Health Department, Lansing, Mich., of interest to the workers in the sanitary field. Illustrations of the earth closet are presented with instruction for its use, which is simple where there are no sewers, in typhoid fever cases, in particular.

R. J. Cluff, manager of the King Radiator Co., Toronto, was a visitor in Montreal on Monday, October 12.

The West Toronto Board of Health has decided to advertise for a sanitary inspector. There will likely be many applications, as the arrangement that West Toronto officials are to be retained in the service of Greater Toronto after annexation makes the position attractive.

The Cameron Septic Tank Company, of Chicago, have reported to the Toronto Board of Control that they are prepared to grant the right to instal the sewage disposal plant under their patent rights for the sum of \$6,250. This position includes all necessary sketch drawings and other information required in designing the plant, or if the Board prefers, the company is prepared to furnish the plans and detail drawings and make monthly inspections of the plant during construction for the additional sum of \$3,125.

PORT ARTHUR M.P. ASSOCIATION.

Master plumbers generally will watch with interest and approval the efforts of Port Arthur plumbers to form themselves into an association. The difficulties of the task are well understood by those who have been through the mill, and the encouragement of every one will

be extended to those pioneers who are starting to do the good work at Port Arthur. Plumbers must stand together for their own good and the welfare of their great industry, and it is only by local and national association work that full strength can be obtained. The secretary pro-tem. of the Master Plumbers' Association of Port Arthur has written to H. Munday, of Montreal, secretary of the National Association, for the constitution and bylaws of the association which would help them in framing their own local rules. It is unnecessary to say that Mr. Munday lost no time in complying with the request. He not only sent them the Canadian and American, but the local rules as well, so that the organizers should have no difficulty in framing a good solid organization. We wish the Port Arthur Master Plumbers' Association every success. A strong pull and a pull all together should carry them over the difficulties besetting the early life of every trade organization.

ADVERTISING GAS STOVES.

Some good suggestions are contained in the following gas stove advertisements clipped from exchanges:

Kitchen economy depends upon saving time, material and labor in properly preparing pure food for the table. There's a way of saving all this and more—that's the gas range way. A gas range kitchen saves time, because it's always ready—no waiting for the fire to get started. Saves material. When cooked on a gas range it's sure to be right. Perfect regulation of heat at the valve. Nothing wasted. Saves labor. No kindling, fuel or ashes to carry, and no fires to build. Kitchen quickly cleaned and easily kept so. A gas range kitchen means economy in cooking.

Gas range comfort. Did you ever figure what a difference having a gas range kitchen makes? Meals always ready on time—no waiting for the fire to get hot, because a gas range depends on neither wind nor weather. Just a match, then turn a valve. Saves carrying kindling and fuel. Fuel delivered right to the gas range where it's always ready on demand, day and night. Results are sure to be right, because the flame is under perfect control and heat is high or low as required for the particular kind of cooking. A gas range means more time and less trouble for you.

Home comfort. If you want to keep your house in order be sure to provide a gas range kitchen. A gas range for cooking means a home more easily kept in order, because it keeps a clean kitchen. Saves the trouble and expense of providing space for kindling, ashes and fuel. Your arrangement for a supply of fuel

is made when you put in a gas range for cooking. The pipe carries the fuel right to the range where it's always ready, day and night, by just turning a valve. Gas range comfort is real home comfort. We connect ranges free if you have the gas in your house.

• • •

You may dress your best while preparing Sunday's dinner without soiling hands or clothing if you have a gas range kitchen. It's good every day—the week—but the cleanliness of the gas range kitchen is especially appreciated when one wishes to avoid dust and muss of handling kindling, ashes and fuel on Sunday. Did you ever figure what a difference in time and trouble saved having a gas range makes? Your Sunday dinner requires less care and attention when prepared on a gas range, and, best of all, results are right because of the perfect regulation of the flame. It's time you had the comfort of a gas range.

• • •

Just a match—then turn a valve. To build a fire in a gas range just light a match and turn a valve. No bother replenishing fires, and it's easy to have the heat high or low, and to keep it there. Perfect control of flame at the valve—on in an instant when needed, a turn of the valve and it's out the minute you're through. Saves expense of starting and stopping—of using fuel when not necessary for actual cooking. When you have a gas range you don't heat the entire stove when only a part is needed. Built to give the special results desired for each particular kind of cooking, the entire range may be used when preparing a complete meal, or any one part may be used alone for preparing a single dish. Saves fuel. A gas range means economy for you.

• • •

Gas range days. Be prepared for demands made on the kitchen—arrange your house for convenience and comfort. In deciding what's best—in fixing upon methods of taking care of conditions in your home, be sure to make a gas range kitchen part of the plan. A gas range is adapted to every kind of cooking—broils, bakes, roasts, boils and fries—can be used to prepare either a single dish or a complete meal. Always ready. We make connections free, if you have the gas in your house.

• • •

It's so easy to have complete comfort in the home. Comfort is half accomplished by using a gas range for cooking—the other half is in having a gas water heater. The combination of the two, a gas range and a gas water heater, makes a sanitary kitchen, and means much to the health of the home. A gas range does away with dust and muss,

and is always ready by just lighting a match and turning a valve. A gas water heater supplies hot water anywhere in the house day and night for both laundry and kitchen—a summer necessity. Supplies hot water for a bath in twenty minutes at a cost of two cents. Any one may have a sanitary kitchen when it's so easy to get a gas range and gas water heater. Why not order yours to-day?

NEAT PLUMBING WINDOW.

The accompanying illustration shows one of the best window displays of plumbing goods the editor of Plumber and Steamfitter has seen outside the big shops in the large cities, and considering that it is shown by a hardware and plumbing firm in a small Western town near the Rockies, between Calgary and



Bath Room Window Display made by Alberta Firm.

Edmonton, great credit is due to the firm, Illsey Bros., of Red Deer, Alberta.

W. J. Illsey, one of the firm, is hiding the view of the plumbing window, but enough can be seen to show its merit. The papered wall and the fitted up bath, closet and lavatory, combined with the mirror, towel racks and towels, go to make up a complete bathroom and the sign, "Estimates cheerfully furnished," while apparently out of place, does not detract from the effectiveness of the display. Mr. Illsey formerly held a responsible position with the J. H. Ash-down Hardware Company, Winnipeg, and his ideas on window dressing can be copied to advantage by the stores in the largest cities.

Illsey Bros., and the head of their plumbing and fitting department, Arthur Desmarchais, are all former residents of Picton, Ontario.

A new waterworks system will be installed at Lumsden, Sask.

TORONTO A MANUFACTURING CENTRE.

The Monarch Brass Co., Toronto, expect to close this week for a new site in Toronto, upon which to build a brass foundry to replace their plant at Port Colborne recently destroyed by fire.

Word is also expected daily from the Standard Sanitary Manufacturing Company, Pittsburg, regarding the site they will select for their proposed Canadian plant at Toronto.

These two plants will help to develop Toronto as a manufacturing centre for plumbing and heating goods. The past couple of years has seen the King Radiator, Somerville Brass and General Brass Companies erect new plants, and the Dominion Radiator Co. move into a large new foundry. In addition to this, the

Gurney Foundry Co. have enlarged their foundry, and the Canada Metal Co. and James Morrison Brass Manufacturing Co. are also erecting new premises.

A SMART BELL-HOP.

Adam, Taylor, secretary of the Taylor-Forbes Co., Guelph, one day last week hurried down to the lobby of the King Edward Hotel where he makes his Toronto headquarters and up to the desk. He had just fifteen minutes in which to reach the station. Suddenly it occurred to him that he had forgotten something. "Here, boy," he called to a bellboy, "run up to 48 and see if I left my watch on the bureau. And be quick about it, will you?"

The boy rushed up the stairs. The fifteen minutes dwindled to ten, and Adam paced the office. At length the boy appeared, empty-handed.

"Yas, suh," he panted breathlessly. "Yas, suh, yo' left it, suh."

CONTRACTS AND BUSINESS OPPORTUNITIES

General Building Notes.

A new Anglican rectory will be built at Swan River, Man.

T. Edwards will erect a residence at Vancouver at a cost of \$12,000.

A new apartment block will be erected at Winnipeg by G. C. Mills this fall.

The Bank of Nova Scotia will build a branch at Harbor Grace, Newfoundland.

J. J. Wright, Toronto, is erecting a \$15,000 residence at Niagara-on-the-Lake.

The N. B. Telephone Company's building at Sackville, N.B., is being extensively improved.

The Y.M.C.A. and the Seaman's Mission buildings at St. John N.B., are nearing completion.

Mrs. J. Dorricott, St. Thomas, has taken out a permit for the erection of a dwelling to cost \$17,000.

S. H. Foster, Winnipeg, has been granted a permit for the erection of a dwelling to cost \$8,000.

Improvements and additions will be made to the Canadian Pacific Railway Hotel at Moose Jaw, Sask.

A new hotel will be erected at Altona, Man., on the site of the old Commercial, which was destroyed by fire.

A. H. Fisk, Montreal, has taken out a permit for the erection of a brick and stone residence to cost \$10,000.

Henry Ingram, of Newcastle, N. B., has been awarded the contract for the erection of a new Anglican rectory there.

A. Mackay, Montreal, has taken out a permit for the erection of three houses of three dwellings each, at a cost of \$12,000.

J. W. Bridgett, Hamilton, will extend the Oak Hall premises at Meaford, Ont., adding an additional storey and a bowling alley.

Dr. J. H. Irwin, Collingwood, Ont., has awarded contracts for the erection of a brick dwelling, estimated to cost \$10,000, to J. Peterman.

Paul M. Clemens, Winnipeg, has prepared plans for an apartment building to be erected for George Stirrett. Estimated cost of building, \$35,000.

The following building permits were issued recently at Winnipeg: J. C. McNab, \$10,000; F. T. Waldron, \$5,000; F. C. Shortridge, \$2,500.

The contract for the new \$100,000 office building for E. H. Cuthbertson, at Fort William, has been awarded to Carter, Halls & Aldinger, Winnipeg.

Building permits were recently issued at Hamilton to Ben Johnson for three frame cottages, to cost \$2,000, and to W. A. Moore for a brick house, to cost \$1,850.

A permit has been issued for a three-storey business block to be erected at Vancouver for H. J. Cambie and S. O. Richards. The building will be of mill construction and will cost \$21,000.

Alf. Cooper has secured a permit to build four houses at Fort William at a

cost of \$6,000, and J. Saunders one to build two brick houses at a cost of \$3,000 each.

The contract for the construction of the Carter-Cotton building, at Vancouver has been awarded to McDonald, Wilson & Snider. This will be seven storeys high.

Recent building permits at Vancouver include: G. A. Burns, \$500; J. S. Chisholm, \$1,800; Charles Gray, \$2,000; M. Foran, \$2,000; C. J. Church, \$1,500; C. J. Church, \$3,000.

Recent building permits at Peterboro include Dr. G. S. Cameron, dwelling and surgery, \$4,500; Robert Fair, alterations to dwelling, \$350; to the Board of Education, alterations to the old Collegiate Institute and to John Sullivan, dwelling, \$500.

H. E. Almond, Vancouver, has taken out a permit for the erection of two frame dwellings at a cost of \$7,000. A permit has also been granted to J. Walker for the erection of an apartment house on Seymour Street, at a cost of \$7,500.

The baggage annex for the new G.T.R. station at Ottawa will be completed this fall and will be occupied for station purposes. It is hoped to have the foundation for the hotel completed ere winter causes a cessation from building operations.

The Union Bank Co. are negotiating for the purchase of property at Saskatoon where it is their intention to put up a suitable building for bank purposes. It is unlikely that steps in the way of erecting a building will be taken this year.

J. Pepin, Montreal, has been granted a permit for the erection of seven houses of three dwellings each, at a cost of \$30,000. J. A. Riopelle has been granted a permit for the erection of two houses of three dwellings each at a cost of \$11,000, and L. Dejoise has taken out a permit for the erection of a dwelling, to cost \$8,000.

Public Buildings.

A new school will be erected at Lethbridge.

A \$20,000 armory may be built at Orillia.

A \$3,000 fire hall will be erected at Brandon.

Ottawa's new separate school will cost \$16,500.

The Winnipeg Theatre, Winnipeg, Man., will be remodelled.

A new post office to cost \$15,000 will be erected at Fairview, B.C.

A concrete swimming pool will be built at Regina, to cost \$2,700.

The question of a new City Hall at Sydney, C.B., is under consideration.

The Canadian Pacific Railway will build a new station at Sutherland, Sask.

The Tuberculosis Hospital, Ottawa, will be started this Fall. It will cost \$35,000.

Geo. A. Proctor, Sarnia, has the contract for building the new post office at Glencoe.

The Michigan Central Railway will erect a new station at Welland in the near future.

Mitchell, Ont., has offered a site to the Government for the proposed new post office.

The congregation of Raleigh Township Church, Chatham, Ont., intend erecting a new edifice.

It is proposed to erect an addition to the Public School at Burford, Ont., at a cost of \$4,000.

A new building is to be erected at the Exhibition Grounds, Toronto, for the York Pioneers.

The new tenders submitted for Ingersoll's new Public School are again considered too high.

A public school building will be erected in connection with the Normal School at London, Ont.

The congregation of St. Aloysius parish, Montreal, will erect an edifice at a cost of \$40,000.

The Vancouver Horse Show Association proposes to erect a large auditorium in the near future.

The Presbyterian congregation, Brownsburg, Que., propose to erect a new church building.

A permit has been granted for improvements and extensions to the Ottawa Collegiate Institute.

The Victoria (B.C.) Tunnel Railway and Ferry Company purposes building a new depot at that place.

Port Arthur will give a ten-acre site for an armory for which the Government has set aside \$20,000.

The Grand Trunk Railway will enlarge the baggage room at the Toronto Union Station, at a cost of \$5,000.

It is reported that the P.M.R. and G.T.R. companies are contemplating the erection of a depot at Chatham, Ont.

The contract for the new Baptist Church to be erected at Auburn, Ont., has been awarded to L. Hill, Blyth, Ont.

The newly-organized Empire Theatre Company has secured premises at St. Thomas and will extensively re-model same.

W. W. LaChance, Saskatoon, has prepared plans for a school building to be erected at Aberdeen, Sask. The building will cost \$4,000.

A by-law has been passed by the St. Thomas City Council authorizing the expenditure of \$10,000 for the erection of a new school building.

The contract for the erection of a new six-roomed school building at White-

wood, Sask., has been awarded to C. W. Hall, Brandon, at a cost of \$15,000.

A building permit has been granted for the erection of the new St. John's school, Montreal. The total cost of the building and equipment will be \$75,000.

The contract for the building of the new Baptist Church at Saskatoon has been let to F. Wood & Co. The price is \$4,500. Work will proceed at once.

The tender of Pattinson & Eilback for the erection of a new church at \$11,000, at Winnipeg, has been accepted by the St. Matthew's Anglican special committee.

Stewart & Whitton, Hamilton, on behalf of the Government, are applying for tenders for combined gas and electric light fixtures for the new armories there.

Mr. Fosbery has purchased land at Montreal for the erection of a school which will cost \$50,000. Work on the new building will be begun probably this month.

J. L. Wilson, Son & Arnold, are drawing plans for the proposed new Grace Methodist Church at St. Thomas, which will be built next year at a cost of \$30,000.

McGill University, Montreal, has taken out a permit for the erection of a four-storey library building, to cost \$150,000, and also for the erection of a medical building, to cost \$175,000.

Controller Hopewell, Ottawa, has prepared plans for alterations to the city hall. The estimated cost is \$50,000, and the proposition will be laid before the Board of Control at an early date.

The Dundas Board of Education wants to enlarge upon the plans for the proposed High School, and it is trying to induce the Town Council to appropriate more money for the purpose.

Plans of W. H. Brown for the new Children's Hospital at Halifax have been approved by the Council of the Children's Aid Society, and it is expected that tenders will be called in the near future.

The St. John (N.B.) Board of School Trustees has awarded to R. A. Corbett the contract for the annex to the Winter Street School, at contract price of \$35,868. The sub-contracts amount to \$13,318.

T. R. Nickson & Company, Vancouver, have been awarded the contract for the erection of the Grandview and Maedonalds Schools. The building will be of brick construction and each will cost \$12,600.

Considerable trouble has been experienced by the Ingersoll Board of Education in securing tenders for the construction of the proposed public school

in Ward One, and while tenders have twice been received, none has yet been accepted.

The sub-contracts for the completion of the work on the new Peterborough Armories have almost all been let by Contractor Proctor, of Sarnia. He states that the entire work will be completed by March, 1909. F. J. R. MacPherson, Peterborough, has the plumbing and lighting contract, and Gurney, Toronto, the furnace installation.

Waterworks and Sewerage.

Verdun, near Montreal, will construct a modern waterworks system.

Halifax City Council has decided to borrow \$10,000 for sewer work at that place.

When completed the waterworks at Yorkton, Sask., will have a reserve of 55,000 gallons.

The trunk sewer at Vancouver, which will be the basis of the Kitsalano sewerage system, is nearing completion.

A by-law has been passed by the ratepayers of Calgary authorizing the installation of additional sewers in that city.

Willis Chipman, C.E., Toronto, has been engaged by the Weston Council to make a report on a possible water supply for the town.

The Canadian Fairbanks Co., Montreal, secured the contract for all the valves, hydrants, etc., for the waterworks at Black Lake, Que.

A by-law will be submitted to the ratepayers of Vernon, B.C., for the purpose of authorizing the expenditure of \$55,000 for the construction of a sewerage system.

Mayor Hall, Victoria, has recommended to the Council that a by-law be introduced authorizing the raising by way of loan of \$150,000 for the installation of a system of surface drainage.

The Peterborough Board of Works is considering the construction of a new outfall sewer on Park Street. Willis Chipman, consulting engineer, Toronto, has been engaged to report in this connection.

Park Bros., Chatham, Ont., have closed a contract to instal two 40,000-gallon submerged centrifugal pumps for Pelee Island Corporation, and a 50,000-gallon pump for H. Kuhlmann, on Pelee Marsh.

Blenheim, Ont., and the Iroquois Pipe Line Co., have come to an agreement whereby the company will supply gas for fuel to the town. The company will also heat the town hall, opera house, post office, and fire hall.

Mayor Oliver, of Toronto, is anxious to push the trunk sewer. He informed City Engineer Rust that he must have the specifications printed by October 15 as the contract should be let by Novem-

ber 1. The City Engineer intimated that the work could not be rushed so fast as this, but the Mayor insisted on his directions being carried out.

The Toronto Board of Control has authorized the City Engineer to make arrangements with the Cameron Septic Tank Company, of Chicago, for the use of their septic tanks in the new sewage disposal plant. The United States Supreme Court recently decided that these tanks are patentable. Mr. Rust made satisfactory arrangements with the company in connection with the Woodbine plant.

Ouimet and Lesage, civil engineers, Montreal, have been appointed to investigate the Rimouski's system of waterworks, and draw up a plan for their improvement. The town takes its water from a lake some five and one-third miles distant, through a pipe which passes up and down hill and is sometimes below the level of the reservoir. Apparently the pipe is too small and besides does not deliver the amount of water it would seem to be capable of.

At a recent meeting of the London City Council an application was received from the London & Western Counties Pipe Line Company, which proposes to pipe natural gas from the Port Dover gas field, for a franchise enabling them to lay pipes and distribute natural gas in the city. There is no doubt that arrangements can be made with the City Gas Company to distribute the natural gas, but the pipe line company feel that it is better to run no risks. The application was referred to the Finance Committee.

Excavating work on the sedimentation basin at the power house at Saskatoon is well under way. The work is in the hands of J. Priel. The basin, which will be divided in the centre when completed, is calculated to hold two million gallons of water. It will be 335 feet long and 105 feet wide. In this tank the water taken from the river close by will settle before it is pumped into the mains for use in the city. About nine feet of water will be kept in it. A concrete division wall in the centre will allow one half to be cleaned out while the other is in use, thus one million gallons of water will always be on hand. The iron pipes of twelve-inch diameter, have already been laid from the power house to the site. These serve as inlets and outlets. A ten-inch pipe serves for cleaning out purposes. The new engine to cope with this extra strain on the machinery has not yet been installed although it is expected here any day now. A generator will also be installed by the city to increase the electric light plant.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Oct. 12.—Business generally is of a brisk nature, especially in the heating lines. Supply houses may not be working overtime, but there is plenty of work going for full staffs. Except in one or two instances, there is no difficulty in despatching goods promptly, as supplies are in fine shape, and users, therefore, can continue their conservative buying without laying themselves open to the danger of being held up for material. Orders are heavier, however, than they were, although still on the light side, compared with other years, and it is evident that the winter rates shortly coming on are reminding consumers in the country and outlying towns and villages that it would be wise policy to stock up for their future requirements.

Building is going along merrily in the residential districts, and foundations of new houses are still being started. There is, therefore, plenty of work offering, although of the small size. Large contracts are few and far between, and there is now no chance of improvement. Architects are busy, however, and have been for some time past, so that things look very promising for next spring. In fact, if matters shape as they seem to be going now, and the plans now being drawn up mature, plumbers should have some fine buildings to tender for next year. Jobbing work continues very good, and most shops are pretty busy with various kinds of orders. Country orders have fallen off somewhat, but that is only natural.

Prices generally are unchanged. Supplies are in good shape, and everything seems to be going along smoothly and steadily if somewhat quietly.

IRON PIPE—Fair orders continue to go through. Considering everything, the bulk moving is not so bad, and with the heavier rates in sight, business should be accelerated. Users' stocks are light and conditions seem to promise steady trade for some time to come. Prices are unchanged in iron pipe as well as cast iron and malleable fittings.

SOIL PIPE—Orders continue to show the stimulation noted in our last issue, and both the city and country trade is good. The demand should improve before the close of navigation. Prices are unchanged, and we quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Orders for lead pipe are of good strength. Plenty of piping is being used, while stocks in consumers' hands are increasing. Pipe and waste are still quoted at 30, and traps and bends at 50.

SOLDER—Solder is in fair demand. Roofers continue to be busy, while

stocks generally are being augmented. There is no change in prices, and we quote 19c for half and half, and 18c for wiping.

ENAMELWARE—The demand keeps up well, although perhaps there is not such a rush as was noticed last month, when manufacturers had difficulty in supplying the needs of the supply houses. There is no change in prices.

BRASS GOODS—The demand has improved somewhat, although the market is not so good as it should be. There is still a call for inferior grades of work, but the better class article is more than holding its own. Prices on high grade stuff are unchanged.

RADIATORS AND BOILERS—Business continues to be very satisfactory, and manufacturers are working at good pressure. Just at present all heating lines are in good demand. We continue to quote: Radiators, at 52½, and boilers at 50 and 10 off. Steamfittings are 66 2-3 off, with a fair demand.

METALS—Tin and lead have strengthened, although local quotations have not changed. The consuming demand has been very good, although ordering continues of a cautious character. We quote: Ingot copper, \$14.25; ingot tin, \$32.50; lead, \$3.60; pig iron, Middlesboro No. 1, \$18.50 to \$19. Summerlee, \$20. Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 21½c.

TORONTO.

Toronto, Oct. 14.—Still increasing business is being done by all the jobbers, and master plumbers report a much improved condition prevailing. The increase in trade is not in the nature of a boom, but rather a gradual improvement. City business is as good as ever, and country trade, while pretty fair, might be better. Competition appears to be cutting down the size of the orders as well as the cautious and economical feeling that pervades a number of the country dealers. Just at this season of the year the country dealer begins stocking up for winter trade, especially those country merchants who are able to save a little on freight taken in by boat. This year, while orders are frequent enough to justify going after the business, they are not of the size of past years.

Enamelware is the best selling line just now, and there is hardly a local man who can get sufficient supplies when he wants them, so great is the demand. The factories are running night and day, one of them, at least, with three shifts, trying to fill the orders being received.

Prices on some cast iron lines are slightly firmer and on one or two brass

lines easier, notably J.M.T. radiator valves and basin cocks.

IRON PIPE—At the old quotations—1-in. black, \$5.11, and 1-in. galvanized \$6.76—good business is being done. Cast iron fittings are still at 65 and 70 per cent.; flanged unions are now 55; nipples, 70 and 10, and malleable lipped unions, 55 per cent., a slight increase. Malleable fittings remain at from 35 to 37½ per cent. off.

SOIL PIPE—Supplies are sufficient for the fair business now doing. Prices are stationary—light pipe 60, and fittings 70 per cent.; and medium and extra heavy pipe and fittings 70 per cent.

LEAD PIPE—Supplies ample and trading fair, covers this line. Traps and bends, 50, and pipe and waste, 30 per cent., continue to be the ruling quotations. Calking lead is at 4½c to 5c per pound.

SOLDER—Slightly higher is wiping solder. It is now 18½c, and half-and-half runs from 19c to 20c. Splendid business is being done. Supplies are none too large.

BRASS GOODS—Continued improvement is noted in brass lines. Patent compression cushion basin cocks are lower by 10c each, and are now quoted at \$1.25. Fuller and compression work are at the old figures.

ENAMELWARE—Very big demand is made for baths and sinks and supplies are hard to obtain. The old January list issued by the Standard Ideal people rules the price quotations.

BOILERS AND RADIATORS—Like enamelware, heating goods are a fall line. Business is fine and manufacturers and jobbers are busy filling the various orders received. Prices remain unchanged.

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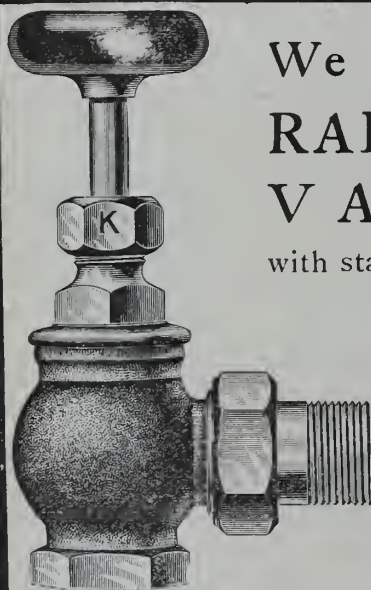
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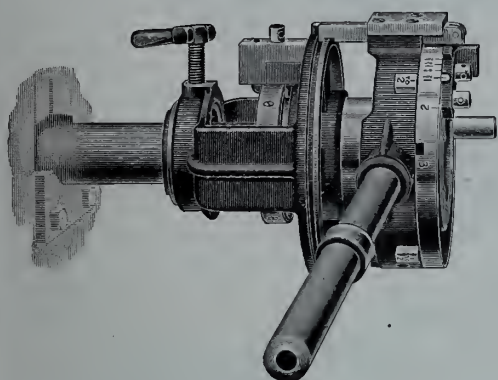
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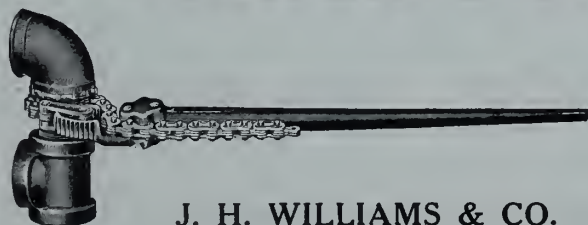


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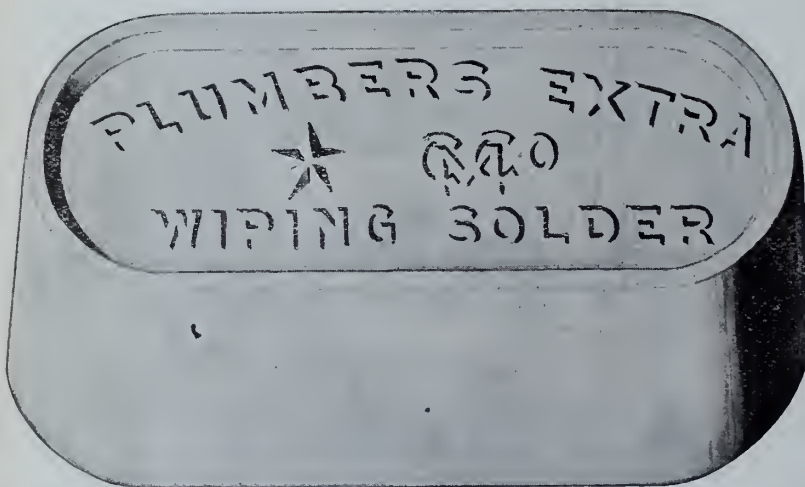
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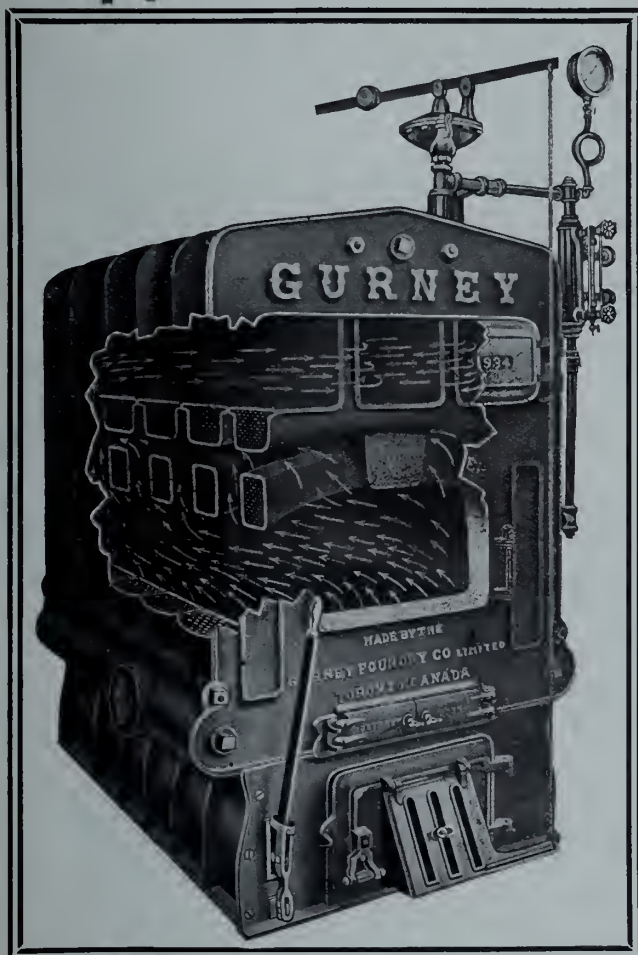
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Essay—H. L. Chandler, Ottawa.

ONTARIO PLUMBERS SHOULD ORGANIZE.

It is to be hoped that success will crown the effort to be made this winter to organize the master plumbers and steamfitters of Ontario into a Provincial association. In another column a letter appears from Vice-President Cooper, in whose hands the National Association placed the work of reorganizing the trade in Ontario. The letter deserves attention, and the best men in the trade will assist him in his effort to secure an expression of opinion before calling a Provincial convention.

Mr. Cooper brings forward some practical questions for a Provincial association to take up and he uses good judgment in relegating to the background the controversial problems of trade regulation which might cause dissension. There is no doubt whatever about the necessity of Provincial regulations governing plumbing work in the cities, towns and villages where by-laws do not exist. This is a question every master plumber can unite upon, and, united, they can secure the adoption of their ideas as it will readily be recognized that the prevention of disease is in the interests of the community at large.

With plumbers leading in a movement to improve the sanitary conditions under which we live, and with repre-

sentatives of the plumbing trade on the Provincial and local Boards of Health, the standing of the plumber in the community will be raised and his work recognized at its true worth. Master plumbers will bear the odium of being highway robbers until they organize and take up questions commanding the respect of the public.

Trade regulation should be a matter of education rather than the main object of organization. Get the trade together on matters of the public good and of business betterment and they will soon see the folly of anarchistic price cutting methods.

The real work of a Master Plumbers' Association should be the education of its members in the principles underlying estimating, the computation of costs, percentages of profit necessary to include on work undertaken, methods of buying, etc. With discussions on these subjects at association meetings the less experienced master plumbers will find it profitable to attend and they will soon see the advisability of figuring on a profit-making basis, the price cutting evil being thus overcome through the intelligence of the men in the trade.

Master plumbers owe it to themselves, also, to do more studying regarding matters having a bearing on their work. In cities where sewage disposal problems are to the front master plumbers should take a leading part in the discussion of the problem. Where a city lacks public conveniences for the use of men and women, master plumbers should urge the establishment of comfort stations in central locations, pointing out the success of such institutions in the leading European and American cities. By studying mechanical and bacteriological problems, by urging public sanitation and convenience questions, and by becoming recognized as an ally of the medical profession in matters affecting the public health, master plumbers will be coming closer to their proper place in modern society.

It is gratifying to note the progress being made in the work of reorganizing the trade in Toronto, and if the master plumbers of Ontario are alive to their interests they will back up Mr. Cooper in his attempt to get a Provincial association organized.

FOLLY OF PRICE CUTTING.

The extreme folly of price cutting indulged in by so many firms must be held largely accountable for the plumbing failures of to-day. Competition is now so keen it is, perhaps, only natural that a young master plumber should be sorely tempted to clinch a contract by tendering a low price. He may have just opened his shop, and is, therefore, terribly anxious to get work. Thoughts of the rent to be paid, the accounts for material to be met, and the salary of a journeyman to be provided, press heavily upon him, and he does not want to lose any time. He must have work to keep things going, and so in his hurry to obtain it, he cuts in at a low price, excusing himself with the reflection that later on, when his name is better known, he will raise his prices.

In his inexperience he does not realise that several grave evils follow his course. In the first place, how much nearer is he to meeting his obligations by doing work at cut prices? What is the use of the master and journeyman being busy if the job be not a profitable one. The man's salary may be provided, but what about the earnings of the master and the consumption of material? The latter has secured what he wanted—work—but is he any the better off for it; has he advanced any further toward success? As a matter of fact, although he may not realize it at the time, he has lost ground. He has lost the time spent on the job—time that could have been employed in looking for something more profitable. In addition he has put himself down as a cheap man, and has lowered the scale of prices in the district generally. Once a plumber starts to cut, he has to go on with it in the majority of cases, for people expect and insist upon low prices from him, and will take the work elsewhere, unless he does what they want.

The result of this is not far to see. Either the plumber goes to the wall in a short space of time—very short if he be a conscientious man, and puts in his best work and material, or he maintains a precarious position by putting in inferior work and shoddy material—a practice which is bound to be found out sooner or later.

Every plumber should do his utmost to keep up the scale of prices in his district. There is no difficulty in getting a fair price if every man stands fair and square. Work may be longer in coming to the young plumber, but when it does come it will recompense him for the waiting. As we have said work is practically useless if there is no profit attached to it. The shop may as well be idle—material at any rate would be saved. It must not be forgotten that a man working on a fair profit, and doing half the work of one who is cutting, will have more money at the end of the year, although he has done but half the work.

LETTER TO ONTARIO PLUMBERS.

Editor Plumber and Steamfitter: Last August the National Convention at Montreal elected me vice-president for Ontario in the National Association, and I suppose the master plumbers who have been reading the trade

papers think I am slow in starting out to do anything towards getting a Provincial association formed in Ontario. But as I am secretary of the Toronto M. P. A. my spare time has been devoted to building up the association in the Queen City, as a good association in Toronto will make it easier to organize throughout the Province.

I am going to put before the master plumbers of Ontario the advantages of an association, not only to better the trade by getting more for our work, but to try and have what work we do of such a standard that the plumbers of Ontario will be looked upon as doing the most perfect work known to the trade. This cannot be done individually, but must be done collectively. Here are some things the master plumbers of Ontario ought to try and secure:

In the first place, we ought to ask the Provincial Government to appoint a Board of Examiners to issue licenses to all plumbers who pass the examination. The plumbing business is more than a trade, it is a profession just the same as a doctor or dentist, for who has more to do with the health of the community than the plumber? If a plumber is called in to do a job and he is not a practical man he does it in such a way that he is a detriment to the trade. Not only that, but he is the cause of spreading disease which costs the country a lot of money to build hospitals so that those affected can be isolated.

The Provincial Government ought to prepare regulations to govern all towns and cities where no by-laws exist, and they should also supply charts showing how work ought to be done, the charts being given to all who are granted licenses. By so doing we would have a healthier community than we have at present. I also think that plumbers have so much to do with the health of the people that the Provincial Medical Health Board ought to have at least two plumbers as members, and every city and town Board of Health ought to include at least one plumber.

A Provincial association could also discourage the manufacture of goods of poor quality, as poor material is a detriment to the rest of our work, for no matter what a plumber has to use he is held responsible.

Now, to get the association going we must not go about it in a half-hearted way. As Charles Dickens once said: "A large number of people are disgusted with their work because they have never tried what a pleasure it is to try to do it as well as it can be done." If you put a tin can on a post and throw stones at it, but if in a half-hearted way, you get no fun out of it, but if you try your best you find yourself in a contest full of interest. So if the plumbers go in for a Provincial association as they would to hit the can on the post, there is no doubt about us soon having a good organization.

By the first of the year or by Good Friday at latest we should have a convention to get down to business, but, in the meantime, I want to find out what plumbers are sincere in wanting to see the trade organized. I am going to take a referendum vote during the coming month by sending out a post card with two or three plain questions for each plumber to answer, and by the replies I receive back I will know what work I will have to do to get all the master plumbers in line for this grand rally.

GEORGE H. COOPER,

Vice-President for Ontario N.A.M.P.

113 Church Street, Toronto, October 26.

How Radiators Are Made

A Visit to the Plant of the King Radiator Company at Toronto—The Process of Manufacturing Described From the Cupola to the Shipping Room.

Last week a representative of Plumber and Steamfitter visited the fine new plant of the King Radiator Company, Toronto, and found a large staff busy in the various processes of making radiators which in the course of time will be installed in heating systems by readers of this article. A description of the different departments through which the radiators pass in their journey from the piles of pig iron outside the foundry, to the shipping platform beside the railway platform will, therefore, be of interest to most readers.

Two lasting impressions were made on the visitor, one being the great economy of production. The large plant is con-

in manufacturing occurs in the mash-way where a workman with a sledge-hammer tests every section for weak spots and every casting with a perceptible weakness is eliminated in order to avoid spending time on machining. Bad castings thrown out here go into the scrap pile for remelting, the only loss being the labor in molding and coremaking. The next test is after the castings have been piled and machined, the sections here being put under a water pressure of 120 lbs. per square inch. Then after the sections have been tapped and the radiators built in to the various sizes desired the water test is again applied. As the highest pressure the radiators are likely to sus-

the radiators will pass from the foundry through the various departments to the shipping room progressively. Just as transportation is one of the important items to be considered in the location of a plant, so is it in the design of the plant. Trucks are being constructed to further facilitate the handling of work as it passes through the departments.

From the various illustrations an idea of the construction of the plant may be obtained. The frame work is of steel and the walls are of brick. The roof is the only part that is wooden and is constructed with 2x3 pine with tar and gravel covering. It is known as slow-burning mill construction.



Fig. 1.—General View of the King Radiator Company's Plant.

structed in such a manner making the least possible waste of time and labor in handling the material in its finished and unfinished form. In only one place is the material handled twice, this being in the testing department where large piles of radiators are to be seen awaiting the finishing touches. It is planned, however, to construct several hundred trucks on which the stocks of unfinished goods will rest while awaiting their turn at the tapping machines, and in this way the unloading and loading of trucks will be avoided.

The second impression was the thoroughness of the test the radiators are subjected to before they are allowed to go to the shipping room. The first loss

in practical use is nine or ten pounds per square inch it will be seen that the test in manufacturing is severe and thorough.

The first requisite of a foundry is its situation, and the facilities of the King Radiator Co., Toronto, for shipping are the best. Fig. 1 shows a general view of the St. Helens Avenue plant, which is situated on the G.T.R. in one of the best manufacturing districts of Toronto. On the right is the foundry, in the centre is the core room, and on the left is the shipping room where finished products are loaded directly on to cars for transportation.

This view gives an idea of the layout of the plant which is designed so that

Andrew & Johnston's hot blast heating system is installed throughout and the pipes carrying the hot air are shown in the illustrations.

A view of the foundry is shown in Fig. 2. The molds are made on molding machines made by the company, about 50 being in use. These are shown on the right of this illustration. The half patterns are mounted on a stationary table, both cope and drag being made on the same machine. The molds are rammed by hand and are lifted from the pattern by four flask bars operated by a hand lever in front. These machines are extremely simple in design and their low cost of production is one of the advantages that led to their adoption.

Practically all the radiator patterns used in this plant can be mounted on these machines, although a combination stripping plate and flask lifting machine is used for making wall radiator molds. Stools are provided on the latter for

are rammed up they are secured at the same time and require no further attention. The number of chaplets used in each mold varies with the number of columns and the length of the loop. The distance between these chaplets depends

vice consists of an arch built of bricks across the diameter of the ladle, the metal passing through the opening underneath to the lip of the ladle. The cupola is lined to a diameter of 52 inches and blast is furnished by a Con-



Fig. 2.—Foundry.

supporting the long green sand cores between the columns. The stools move upwards by the lifting bars, supporting the delicate cores until the mold is lifted from the machine

The Molding Machines.

The depth that the chaplets enter the patterns depends on the thickness of the casting, which is usually heavier at this



Fig. 4.—Core Room.

largely upon the strength of the core sand mixture used. As the force these chaplets are compelled to resist is the difference in weight between the core and the amount of metal it displaces, and as this is distributed among a large number, no great strain is placed on any one chaplet.

As radiator molding is carried on without the use of bottom boards, and to give the molds the desired incline to facilitate the running of the metal, two straight edges are imbedded in each floor throughout its entire length. Between these the molder prepares a level surface with another straight edge upon which he sets his drags, after which the cores are placed, the copes rammed and the molds are closed.

The general view of one section of the foundry is shown in Fig. 2. This department is 200x110 feet and is divided into three bays. The building is of steel and brick construction and is well lighted on four sides by double windows 8x10 feet. The foundry has an extreme height of 34 feet and ventilators extend the length of both sides of the monitor. A mashway in the centre of the shop extends its entire length, the molding machines being arranged along the sides of the building.

Melting Equipment.

The cupola shown in Fig. 3 is located in the middle bay at one end of the shop and taps into a skimming ladle from which the molders secure their iron. The cupola is a Colliau manufactured by Byron & Co., Detroit. It melts 12 tons per hour and uses 8½ to 9 tons iron to one of coke. The skimming de-

nersville blower driven by a 20 horsepower motor. This set is mounted on an elevated enclosed platform. The charging floor is 32x40 feet and is provided with a scale at the elevator opening on which the charges are weighed before being dumped into the cupola or piled for future use. The capacity is 2,000 loops daily.

The core room of this plant is shown in Fig. 4. It is 50x100 feet and is well



Fig. 3.—The Cupola.

point to allow of a flat surface being made on the core on which a small piece of tin is placed to prevent the chaplet from sinking into the core. It will be seen that when these chaplets

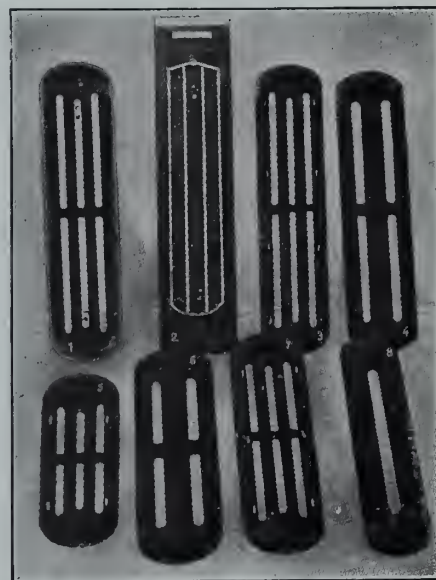


Fig. 5.—Core Box, Vent Plate and Various Cores.

equipped for the economical production of difficult radiator cores. The four stationary ovens, built after their own design, are coke fired from the rear, each oven being 8x9 feet and 7 feet in

height. A transfer track shown in Fig. 4 is used instead of a turntable, and extends almost the length of the shop. This permits the core racks to be unloaded where the cores are stored for future use and the racks can also be

involves problems not frequently encountered by the average coremaker. The pasting of cores is obsolete practice in radiator plants, and vents are not made with wires. In Fig. 5, 1 shows the core box of a four column core. A core pan

them to readily leave the castings. As the metal very nearly covers the core the reason for striving in this direction is apparent. A good, sharp sand is generally used, mixed with linseed oil and resin. In Fig. 5—3, 4, 5, 6, 7 and 8 show a variety of radiator cores. These are made to withstand rough handling in both the core room and the foundry.

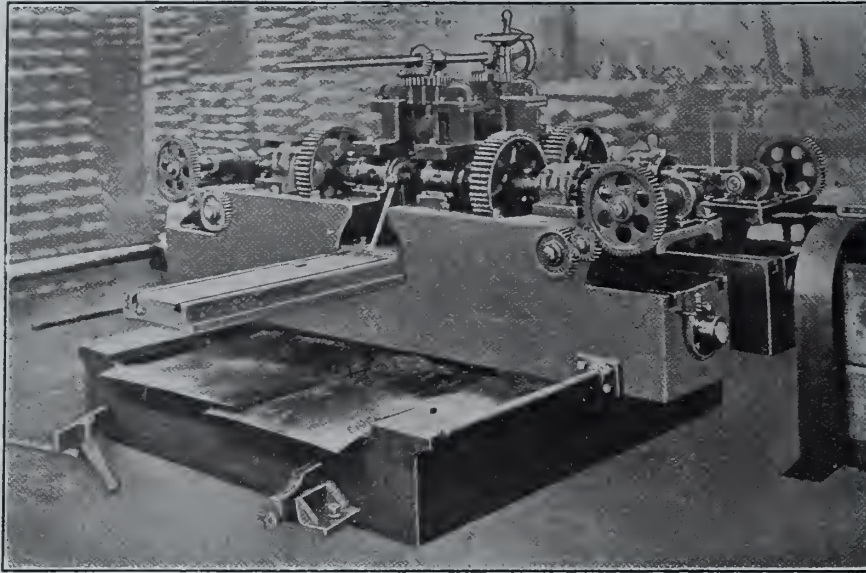


Fig. 6.—Radiator Tapping and Facing Machine.

conveyed to the coremakers' benches when empty. Each oven will hold one rack, with a capacity of 180 cores.

The sand is delivered into a pit located at one end of the shop and is elevated to a mixer on a raised platform by bucket conveyors. The mixer and conveyor was installed by the Standard Sand & Machine Co., Cleveland. When

similarly constructed, in which the core is dried, is used in making the other half. After the sand has been packed in the core box and the pan, the vent plate 2 is used. The vents lead to one point and a corresponding vent is made in the mold to permit of the escape of the gases through one opening. After the vent plate has been applied to both

The Cleaning Room.

The castings are brought from the foundry to the cleaning room where they are placed in tumbling mills and ground. This room is 45x50 feet and is equipped with five tumbling mills installed by the Whiting Foundry Equipment Co., Harvey, Ill. The mills are driven by a 20 horse-power motor.

Testing Department.

The next step in progress of the work through the departments is the first testing operation. The testing and assembling shop is 250x107 feet. The sections which are only 5-32 of an inch thick, are subjected to a hydrstatic test of 120 lbs. per square inch.

They are then tapped on the tapping and facing machine shown in Fig. 6. Two of these machines have been erected and another is under construction. It taps and faces four openings in a radiator section in one operation. It is adjustable for radiators of various lengths and widths. The angle sections for bay windows are machined on a boring mill.

An assembling machine is used for fitting the loops together. Before the



Fig. 7.—Erecting and Shipping Room.

the sand is prepared it is wheeled along a platform above the coremakers' benches and delivered to them through holes in the floor of the platform, no time being lost by the coremaker while the sand is supplied to him.

The making of radiator cores in-

halves of the core, the core box 1 is closed over the half core in the pan, rapped and lifted off. This operation finishes the core, which is set on a rack in the pan. As the cores are made entirely without rods or wires, a sand mixture must be used that will permit

loops are tapped and faced they are subjected to a hydrstatic test singly and if found imperfect they are consigned to the scrap pile. After assembling they are subjected to a second test before shipping. Fig. 7 is a view of the shipping room. This view gives



Fig. 8.—Machine Department.

a good idea of the construction of the building.

Fig. 8 shows the well equipped machine shop located in one corner of the building. Here the metal patterns are finished and mounted on the molding machines and the cast iron flasks, which are used exclusively, are fitted and faced. The flasks are simple in design,

being made without bars. All the tools and equipment are electrically driven by motors, the system of group driving being used. The power is brought from Niagara at 22,000 volts and transformed down to 550.

R. J. Cluff, the general manager of the King Radiator Co., Ltd., and J. C. Harley, formerly of the American Radiator Co., is superintendent.

Why Smoke Tests Should Be Made

In discussing the paper on "The Reasons Why a Smoke Test Should Be Made on Completed Plumbing, and the Proper Method of Making It," by H. J. Luff, Cleveland, read before the American Society of Inspectors of Plumbing and Sanitary Engineers at its meeting in February, several members took part as follows:

Charles Francis:—It is a question among sanitarians just what harm sewer gas does, and we find out now what kind of things are done by it. If the people in that grocery store were all sick and they had the same sort of disease, was it enteric—that is, in the nature of typhoid occasioned by germs which were produced in and carried by sewer gas into the food, into the milk and oysters—or was it simply the exhalation of the sewer which produced diseases of the throat, such as quinsy and that sort of thing?

Mr. Luff:—I think it is reasonable to suppose that the clerks partook quite freely of those things that were sold in the store, and possibly it was the effect of the food that they took from those coolers that produced the result.

Mr. Francis:—But you have nothing to show that anybody outside where that stuff was sold was made sick by those things?

Mr. Luff:—No, that was not traced up.

John E. Harbison (Schenectady, N. Y.):—Would the smoke test of new work be advisable where you could not get any water test?

Mr. Luff:—I should say it was very desirable.

Sickness Due to Broken Vents.

Mr. Harbison:—In connection with the smoke test on old work, in the office of the General Electric Works at Schenectady, where there are about 1,200 employees, there is running up through the centre part of the office a shaft from the basement to the roof. Right against the side of that shaft there is a battery of closets on each floor. There were a number of clerks whose desks were up against the sides of the shaft, and while working at their desks they were facing this shaft continually all day

long. There was a great amount of sickness, and it all applied to those clerks that were alongside of this shaft. One of their best engineers was taken sick and died. The company tried to ascertain what was the cause of his sickness and his death. They looked the records up where he had been and where he had lived, and so forth, for some time back, and nothing could be discovered that would lead to the disease which he had, which was typhoid fever. They sent a communication to the Board of Health, asking if the plumbing could be tested. I put the smoke test on that system of plumbing. I found that pretty near 3 per cent. of the closets that were installed so near the shaft had the vent horns broken off. They were the old style No. 3 washout closets—by the way, we have discontinued using these—and I made my report to that effect, and it was uniformly decided by physicians and others that bad plumbing was practically the cause of the sickness and the death of that man.

President Davis:—Mr. Harbison, the question has been raised, was that a local vent horn that you had been referring to?

Mr. Harbison:—No, not local, but a direct sewer vent horn.

Place for Applying Smoke Test.

H. W. McVea (Omaha, Neb.):—Does it make any difference in regard to the test what part of the system the machine is attached to, top or bottom?

Mr. Luff:—It is preferable to attach it to the bottom, so that the smoke goes throughout the system and out through the roof. I think it would be done easier and quicker in that way than to attach it at the roof and pump down.

Mr. Harbison:—I agree that the more successful way is to attach the machine at the bottom and have your machine on the outside.

Thomas A. Claffy (Chicago):—I would like to bring up the question of the efficiency of the smoke test against the peppermint test. If the peppermint test is applied as thoroughly as the smoke test in the descriptions given by Mr. Luff, wouldn't it be just as effectual?

Then there is the question of the cost of the machines. Who should bear the cost of supplying the machine that will apply that smoke test? Those machines cost a great deal of money and it is easy to burn them out. I remember when that test was applied to the City Hall here there were so many leaks on the system that the fire had to be kept going at quite a pace, and they burned out the hose. They had a hose that was worth probably \$10, and I suppose they had to throw it away when the job was through. Along with the time spent there was \$10 for a hose, and goodness only knows what other damage was done to the machine. Those are points, it seems to me, that should be considered and discussed. It is not a question of whether the test will show anything. The question is, will the peppermint test show the defects in a system as well as the smoke test, both tests being applied in the same way—that is, the same care being taken to see that either the peppermint or smoke gets into all parts of the system? The question of diseases I think we had better steer clear from, in order to save time, because every one of us here can relate experiences that would no doubt be very interesting, but I think that discussion had better be left for this evening.

The Peppermint Test.

Mr. Luff:—In making the peppermint test, immediately your leaks are manifested you have got the atmosphere permeated with peppermint, making it very difficult indeed to accurately locate the leaks. Then, again, there is the possibility that the leaks may be above your head and may remain there—that is, the atmosphere above may be permeated to some extent and remain that way for some time, so that you could not detect it. If you want to ascertain whether the trap seals are secure on all the line all the way through, the down spout, and so forth, you have quite a proposition to get all over and find out, particularly when they are on the outside of the building, because the odor of the peppermint is very soon dissipated on the outside and you cannot determine those facts very readily that way. When you have ascertained that there is a defect you have got quite a job hunting it up, particularly if it is in a partition. With the smoke test, immediately a leak is manifested you can detect where the leak is coming from. If it is in a partition you can take an electric light bulb and drop it down in the partition and find out just where it is and be able to cut out at the right point to repair it. All of those features should be taken into consideration from the commercial standpoint, with a view to making the test economically in the interest of the property owner.

Best Types of Plumbing for Sanitary Purposes

Address by Stephen Garrity, Lowell, Mass., Before the American Society of Plumbing and Sanitary Inspectors.

With an experience of thirty-five years at the plumbing business as an apprentice, journeyman and plumbing inspector, I am led to believe that I can say something upon the subject from a common sense point of view. I firmly believe that the time is near at hand when much that is superfluous and useless in the plumbing trade will be eliminated and I look to this society to start the movement in that direction. While I am deeply sensible of the magnitude of the task and I know the difficulties to be met with, I am also conscious of the fact that it is well-nigh impossible to make iron clad rules. Circumstances and conditions arise at times which make it imperative to deviate. Very often members of boards of health are appointed that have no qualifications for the place and yet make and unmake rules; still I would be in favor of the State framing a code of plumbing rules, as there then would be a uniformity. I suppose it would be unfair to expect the average board of health to have the technical knowledge necessary, so that if the State framed the rules they would be done by experts.

I regret very much that circumstances prevent my going into this subject more deeply, as there is so much to be said upon the different rules that are in vogue all over this country, their advantages and disadvantages; still I believe if the proper authorities get together, more uniformity of rules will be had, and again, the owner ought to have some consideration, give him a chance to make needed alterations, don't surround him with so many useless exactions. It is too bad that there is such a diversity of plumbing all over this country. Hardly any two cities in this broad land have the same rules, one set of rules insisting that the top fixtures on stack be back vented, notwithstanding the stack passes through roof full size, another set says it is necessary, so there you are.

Plumbing Regulations Uniform.

In my opinion it is very short-sighted policy to put into the plumbing system that which is needless, thereby adding to the cost, and it doesn't make any difference whether the owner is rich or poor, the principle is the same. I believe there should be just and proper modifications of existing plumbing rules. If the main drains, soil, waste and vent pipes are too large, reduce them; if there is too much back venting, cut out that which is useless; don't put anything into the plumbing system. The mere fact of cutting out of the plumb-

ing system that which is needless, does not in my opinion injure the trade; it is rather a benefit, reducing the cost, consistent of course with good judgment, allows of more and better fixtures, more open work, tiled floors, etc.; many times work is deferred owing to the unreasonable exactions of many of our plumbing rules.

I find in my experience with honest and fairminded journeymen and master plumbers an overwhelming sentiment in favor of a proper modification of existing plumbing rules and would welcome the same.

Plumbing in Cottages.

We will take the cottage house for example, with the usual fixtures. What do we find? Generally a twelve-inch sewer in street, the house sewer within five feet of foundation wall of five or six-inch; in some cities through the foundation wall there must be a length of five-inch iron with a five-inch running trap with two hand holes, five-inch Y and $\frac{1}{2}$ bend with brass clean-out in straight end of same, a fresh-air inlet with cleanout. The main drain is carried through cellar, sometimes underneath, and sometimes overhead, to a point where vertical stack connects to take the waste, etc., from fixtures above basement. At the bottom of this stack is placed a brass cleanout, generally made of cheap material, difficult of removal for different reasons (lack of room, head of nut so soft that it is impossible to move with monkey wrench, etc.); imagine one unskilled removing it in some sort of way—it doesn't need much stretch of the imagination to see the mess made of that brass cleanout. Now I would not prohibit the use of cleanouts altogether, because I can call to mind a splendid cleanout that is on the market for years and always used on good work. Of course there is a great difference in the cost, but there is also a great difference in the cleanout.

I am very much in favor of returning to the old-fashioned way, that is to have the plumber remove the cause; don't use a plunger to push the obstruction farther along. So I say, eliminate the cheap cleanouts and the one at the front wall.

The Sink and Bathroom.

A little farther along we arrive at the kitchen sink which is trapped and back vented as usual; there we get ready for the bathroom, consisting of water closet, bathtub and basin. A four-inch lead is put in to take earthenware water-closet, with an opening of from

two and one-half to three and one-half inches. Into this lead bend is wiped an inch and one-half lead pipe, varying in length from one to two feet, to take the waste from the four-inch round trap that serves the bath tub and basin. There is no fixture above this bathroom, the soil pipe passes through roof undiminished, still some rules insist on both those traps being back-vented. Now whether you wipe into a lead bend or put in a four by two Y to take the waste, the principle is just the same; one can readily see by beginning with me at the front wall of this cottage and moving step by step, and will agree that considerable of a reduction can be made with benefit to all parties concerned. To reiterate, I will say that it is folly to put in five-inch pipe when four-inch is ample. Too large a drain or soil pipe and too much back venting answers no useful or ornamental purpose and the sooner the trade recognizes that fact the better.

Some of us can remember the time when we didn't have the abundant water supply we have now; then the water had to be pumped into cistern in attic and distributed through the house; then we had to be more saving, but now I rather think that even if siphonage takes place, which is very seldom, the chances are that the traps don't remain long unsealed by reason of so much use, leaky faucets, etc.

Plumbing in Factories.

The best system is one that is well lighted, drained and ventilated, the floors and sidewalls should be water tight with cesspool in floor and hose connections for cleaning and flushing purposes. Locate sink in middle of room, out in the open, so as to get at it from all sides, and supply with hot water, too, having the drain and soil pipe of adequate size, and no more. The water-closets should be of the simplest kind, the least mechanism the better, with a good flush and when a heavy all earthenware combination water-closet with full-sized opening, with one and one-inch flush pipe, an extra heavy two-inch straight valve, with chain and pull, a good ball cock and the circuit system of back ventilating is used, and in my opinion it can't be beat.

The plumbing systems in our factories do not connect with the public sewer; they drop into a raceway of canals, the stack is open at top and bottom, while the canals open into river, the water being pumped into tank on top floor, to supply the different fixtures. Considerable trouble is caused by pieces of wood that are taken into the tank from steam pump, and again when the factory is closed, the pump is not working. This water is never used for drinking purposes, as it is unfit for use, city water being supplied instead.

Faulty Chimneys and Drafts

C. E. Oldacre Outlines How Some of the Faults Can Be Remedied—Bad Construction of Chimneys the Bane of the Heating Contractor.

Much has been said and written in the trade papers concerning the question of the proper construction of chimneys and the question of good and poor drafts.

For all that has been said bad drafts and poor chimneys from one cause or another remain the bane of the heating and stove trade.

The idea obtains with many that a good or bad draft is some peculiar quality of a range, stove or heater when such is in no way the case.

Many cases are to be recalled where otherwise good cooking and heating apparatus has been condemned for no other reason than a poor working chimney.

The reputation for good or poor working is too frequently established by a poorly constructed chimney.

Poor drafts plus poor management is without question, the cause of three-fourths of the complaints made against the working of heating and cooking apparatus.

How to Build Chimneys.

To ensure a good draft a chimney should be built square or round and of its full area throughout its entire course; it should not be enlarged at some point and decreased at other points; the flue should be intact within itself; it should have no openings in it except the opening for the particular stove or heater that it is intended to serve; there should be a separate and independent flue for each stove, heater, range, boiler or fireplace; no one flue should have more than one stove or other heating or cooking apparatus attached to it; it should be carried higher than any adjoining or near-by roof away from the influence of all untoward wind currents; it should not be plastered on the inside; it should not have any turns where soot is likely to find lodgement; it should be constructed of good hard brick laid in lime and cement mortar; the walls should be not less than 9 inches thick with the joints well struck or else 4 inches of brick with a terra cotta lining.

The poorest shaped chimney is the rectangular one, whose depth is only one-half or less than the width. Probably the most practical one is the square

chimney, but the first one is the round chimney.

A round chimney whose diameter is equal to one side of a square is equal in capacity if not greater than such a square chimney.

The poorest kind of a chimney for either soft or hard coal burning is a chimney which is only 4x8 inches in an outside wall with but 4 inches of brick between it and the outside. Such a chimney is likely to have the mortar between the joints soon eaten away by the action of the sulphuric acid generated in the process of combustion combined with the moisture absorbed by the brick.

Location of Chimney.

The best chimney is the one that is built through the centre of a house or building, or one that has no outside wall exposure, and which is straight and true throughout its entire course, whose smallest dimension is not less than 9 inches, is tight, has but one opening for a stove, heater, range or fireplace, is provided with a tight-fitting clean-out door at its bottom and is carried up to a sufficient height where it is uninfluenced by untoward wind currents due to roofs or over-hanging trees.

No chimney should be built less than 9 inches square (some cities have by-laws now to this effect for the purpose of safety).

The chimney should be proportioned to the work it has to do—that is, its size should bear some relation to the size of the grate of the heater or if for a fireplace there should be a relation between the size of chimney and the size of the opening of the fireplaces.

For fireplaces a safe rule is that the area of the chimney should be one-tenth of the area of the opening of fireplace.

For the average house range or stove the 9x9 chimney is usually ample.

For larger ranges—as hotel ranges have 2 or 3 fires—a 9x13 or 13x13 chimney should be used.

Drafts Easily Controlled.

It is easy enough not to have a sufficient draft but too strong a draft can hardly ever be complained of, as a tight

(or nearly so) damper gives control of the draft at all times.

For heaters and boilers the following sizes with the average height of chimneys (from 35 to 45 feet) as found in the average house or building will be found ample:

Dia. of grate in inches.	Size of chim. in inches.	Area in inches.
18	9x9	81
21	9x12	108
24	9x12	108
30	12x12	144
36	12x16	188

For larger sized grates or different dimensions a safe rule is 1 square inch of grate for each 5 or 6 square inches of grate area, with no chimney less than 9x9 inches. This is applicable to house heating apparatus, whether warm air, hot water, or steam.

No complaint on account of lack of size of chimney can obtain if the sizes approximate the above given dimensions.

Tile Linings.

The dimensions of tile linings are measured from the outside and they are from $\frac{3}{4}$ to $\frac{1}{2}$ of an inch thick.

Though the inside measurement of a tile for flue lining is smaller than would be that of a chimney without the lining, the chimney with the tile or terra cotta lining will be found under equal or similar conditions to have the best draft. The reason for this is that the surfaces being smoother afford less friction for the ascending gases, and there is less likelihood of small openings into the chimney due to loose mortar joints.

The chimney with a terra cotta lining will remain a good working chimney much longer than one that is not lined as the surfaces being smoother will gather less soot and the brick joints are protected from the eating action of the sulphuric acid generated in the process of combustion.

No chimney should be plastered on its inside as it is impossible for the mortar to remain intact and in place, so that the flue that is plastered soon becomes ragged on its sides and the plaster is most likely to become loosened and lodge in the chimney, stopping the draft partly or completely, accord-

ing to the size of the chimney, its construction or shape.

Openings in Chimneys.

Chimneys having more than one opening should have such openings tightly bricked and mortared up. No dependence should be placed in metal stoppers as at their best they fit very loosely and are likely to drop out or be blown out. Neither should an opening be closed with paper, cloth or other inflammable material—it is dangerous.

No wood work should ever have footing or bearing into the brick work of a chimney. The joists coming close to a chimney or fireplace hearth should be carefully trimmed.

More house-fires are caused by defectively built chimneys or chimneys that have been allowed to become defective than any one other cause.

The records show this and most cities have by-laws defining how chimneys are to be constructed for safety.

Too much attention can not be given to the matter of the construction of chimneys—no matter for what purpose they are to be used—nor can the inspection be too close to attain the best results or for the purpose of the greatest safety. Even where work was under the supervision of a properly appointed and experienced building inspector the writer has heard of cases where the terra cotta lining that was used was dragged upward continually as the brick work progressed, so that the lining always appeared above the brick work and gave the appearance of a well and properly lined chimney, while really there would be only a few lengths of lining used, leaving most of the course of the chimney with but 4 inches of probably soft brick around the flue. This was in speculative or bonus work when the whole object was to save a few pennies or more at any point possible. No safety or good results should be expected with chimneys built in such a manner.

Openings for Vents.

Openings cut into chimneys for vent pipes, or local vents are often the cause of trouble with the chimney, especially if the opening around the pipe is not properly bricked up and mortared. The writer can recall cases where two or three bricks have been knocked out of a chimney above the ceiling of the upper floor, for the connection of a vent pipe for the plumbing fixtures and no attempt has been made to close the unnecessary opening left around the pipe. Such practice is not only dangerous but is likely to ruin the draft. Separate flues should be used for such purposes and they could be run up alongside of

the chimney flue, if required. These vent pipes being only metal they are sure to soon rust out at or close to the point where they are joined to a used chimney, on account of the gases and acids generated in the process of combustion of either soft or hard coal. Sulphate of ammonia, chloride of ammonia and free sulphuric acid—all active corrosive agents are to be found in the soot where coal is used.

Coal Gases Corrode Metal.

If any one would like to test for themselves the amount of ammonia fumes that can be liberated from the soot of coal; take a pint of soot and work it into a thick paste with water and then drop in a few lumps of unslacked lime or a few small pieces of carbonate of potash (or common lye) and very shortly the ammonia fumes will become quite noticeable. An agitation of the mixture will quicken the process.

Further, if you would like to see the action these salts and acids have on metal dip small strips of various metals, iron (plain or galvanized), zinc, tin, copper, aluminum or other metal into the mixture and it will be seen how quickly the metal strips will be acted on. Of course, this action to a perceptible extent does not take place immediately, but the time will differ according to the different metals tested.

This little test will show the most sceptical the cause of the rusting of smoke pipes, interior casings, and other interior parts of stoves, ranges, heater boilers and furnaces. It shows the great necessity for keeping the pipe and flue spaces as clean of soot as possible especially when the fires are out and when the soot is likely to accumulate moisture which accelerates the rusting or corroding process.

All heating and cooking apparatus is subjected to more real wear when not in use than when they are actually being used. This is well illustrated in the case of a cooking range using coal 12 months in the year continuously and the case of a heater or furnace that is used only 5 to 7 months in the year. In the first case, the smoke pipe, though it may be much lighter and thinner, will last much longer than will the smoke pipe of a furnace or heater. In the first case the smoke pipe is kept perfectly dry, and in the other moisture is likely to soon become absorbed by the soot remaining in the pipe after the fire is left out.

Even boiler explosions have been traced to leaky joints, allowing water to drip slowly on to parts of the boiler

covered with soot. The gradual eating away of the shell at such point has weakened it to such an extent that the boiler could no longer stand the strain put upon it—the point of rupture starting at the eaten part of the shell and not from the point where the first leak took place. Such explosions are a matter of record.

Points About Smoke Pipe.

Another point that needs be well looked to is that the smoke pipe is not unnecessarily decreased in size at any point.

Where the pipe enters the chimney a collar of metal or terra cotta should be well mortared in and this collar should be of the same size as the pipe that enters the chimney. No loose collar or band over the outside of the pipe should be depended on for the joint. It should, of course, be seen that the smoke pipe in no case enters into the inside of the chimney so as to reduce its free area.

Outside of hot air furnaces the heating or cooking apparatus should be placed as near to the chimney as possible making the smoke pipe short and it should also have as few bends or turns as it is feasible to use.

It is much better to get the heater or boiler as close to the chimney as it can be conveniently placed, paying no attention to the idea that the mains (hot water or steam) need be carried a little further than might otherwise be the case.

No attempt should ever be made to run two smoke pipes from one furnace boiler or heater, particularly if these smoke pipes should be run to opposite sides of the house as one pipe is sure to work against the other—one probably having a down draft, checking the draft in the other pipe. Which pipe it is that will be the one having the down draft is also likely to be changeable according to the direction of the wind. The writer tried off and on for a whole winter to make such a case work but failed. In the end the remedy was a new chimney built of the proper size and height.

(To be continued.)

NOT A MATTER OF CREED.

During the recent M.P.A. convention at Montreal a visitor who was addicted to walking in his sleep went to bed all right, but when he awoke he found himself on the street in the grasp of a policeman. "Hold on," he cried, "you mustn't arrest me. I'm a somnambulist." To which the policeman replied: "I don't care what your religion is—yer can't walk the street in yer nightshirt."

ANTI-SYPHON TRAPS.

The anti-syphon trap has undoubtedly been a source of much controversy, writes T. J. Claffy, assistant chief plumbing inspector, Chicago. Most plumbers would tell you it has also been a source of much filth. There is no doubt that it has been and is a very handy thing in a pinch. It is also a dangerous thing in the hands of a careless or ignorant mechanic or designer.

The manufacturers and designers of anti-syphon traps are too well informed in the principles of dynamics and atmospheric pressure to attempt to controvert any of these principles or laws, and do not claim impossibilities for their respective traps.

The necessity of thorough ventilation of all soil waste and drain lines is acknowledged by every thinking man in the plumbing or engineering line. The necessity of vents to protect traps from losing their water seal by syphonage or concussion is also admitted. Municipalities have in accordance with these accepted doctrines enacted laws and ordinances requiring the installation of such vent lines as may be necessary to conform with the accepted doctrines and the details are modified as may be necessitated by the climatic and topographic conditions.

Now, if it is necessary to enact laws for the conservation of public health, and such laws have never been declared unconstitutional or unreasonable by any court, then we must accept them and be governed accordingly. Consequently, if a municipal code requires the protection of the water seal in traps by vent or vent lines of pipe, such vents must be installed. "Exceptions prove the rule." So it is with traps and vents. Conditions sometimes prohibit the possibility of venting a trap as required by the ordinance. In such circumstances the proper authority is invested in a board or in an individual to grant a dispensation and instal such trap or contrivance as will attain the end sought by the ordinance or law which has been dispensed.

It is decidedly unsafe for any municipality to let down the bars promiscuously for the benefit of manufacturers or dealers in anti-syphon traps. The reason is obvious. Hence, the laws which now govern plumbing installation throughout the land.

We know that traps will syphon, that capillary attraction and condensation will rob them of their water seals. We also know that concussion due to flooded sewers or drains or other obstructions also robs them of their water seals.

Have we anything to prove that the same causes will not have the same

effect on anti-syphon traps? We know that anti-syphon traps will retain a water seal despite certain reasonable efforts to unseal them, but can we prevent concussion, or in common terms "back air," from doing so? Not without the use of a proper vent. Long lines of waste pipe from traps to sewer drain or main waste pipe are sources of foul gases from waste decompositions which, unless carried off by a vent line, escape through the water seal of the trap anti-syphon or otherwise, in the course of time.

"Back air" is the most serious menace to the use of anti-syphon traps, then comes syphonage and fouling; the liability to syphonage being increased as the fouling matter accumulates, for the scouring properties of a trap are more or less restricted by the construction of devices which are depended on to prevent syphonage. "Back air" or concussion in waste pipes and drains is something impossible to guard against as long as storm water or excessive flows of sewerage must be carried, in any other reasonable and economical manner than that which is in common use, viz. vent and revent pipes.

An anti-syphon trap is an excellent

thing in its place; so is the pardoning power endowed upon governors of states in the penal code; a thing to be used with discretion and conscientious care.

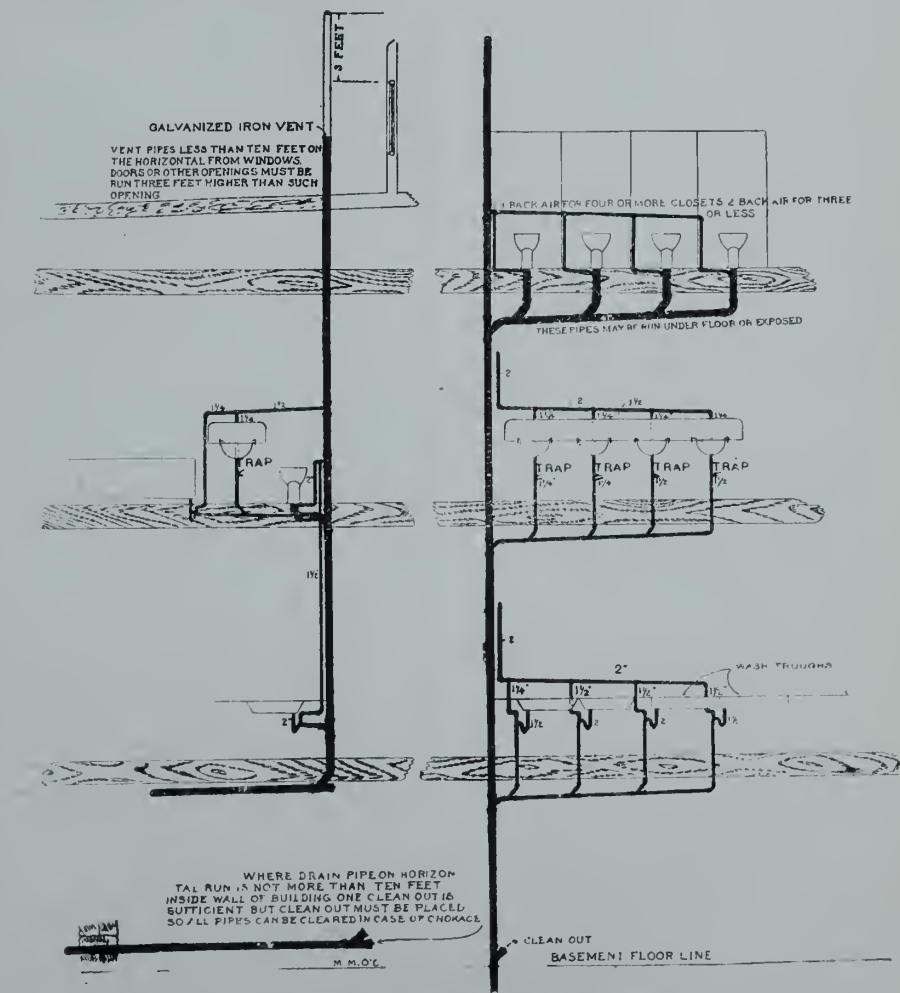
TORONTO PLUMBERS ORGANIZING

The Toronto Master Plumbers' Association is planning an active campaign during the coming winter and at the last meeting appointed a ways and means committee to arrange a programme of social and educational gatherings under the auspices of the association. The committee consists of George Clapper-ton, Alex. Purdy, Robert M. Youmans, Walter Benson and George H. Cooper. The association is working along right lines and every master plumber with the best interests of the trade at heart will support the organization in its educational work.

CRAZY WITH THE HEAT.

"Can you tell me what steam is?" asked the examiner.

"Why, sure, sir," replied Patrick confidently. "Steam is—why—er—it's wather that's gone crazy with the heat."



OTTAWA PLUMBING CHART—NO. 4.

Value of Grease Traps in Plumbing

By J. J. Cosgrove in the Plumbers' Trade Journal.

In buildings like hotels, hospitals, sanitariums, and private houses, where foods are prepared for consumption, and cooking, baking, and washing of dishes is done, more or less grease, oils and fats find their way into the drainage system, and it is the experience of plumbers that the grease congeals on the inside of the waste pipes until successive deposits completely fill the bore of the pipe. When the grease is emptied into the sink it is in a fluid state, and carried in suspension by the water; as soon as it is brought into contact with a surface which is cold it will congeal and cling to that surface. If, however, before the grease becomes cold, it is stored in a receptacle containing water, the grease will rise to the surface, and, as soon as it becomes cold, will form a film over the water which can be removed in a solid state. It is to this fact that grease traps owe their value, and recognition of the foregoing principles was the basis of their design.

A grease trap is simply a catch basin, constructed of any suitable materials and so arranged that water can flow through, depositing its grease within the basin, while the waste water flows off practically clear of clogging materials. A grease trap made of iron is shown in Fig. 1. The water flows into one end of this receptacle into a large body of cold water which immediately chills the grease. Owing to the large size of the basin the flow of water through it is at a low velocity which allows the grease to rise to the surface, where it forms a thick surface seum. The waste water then passes through

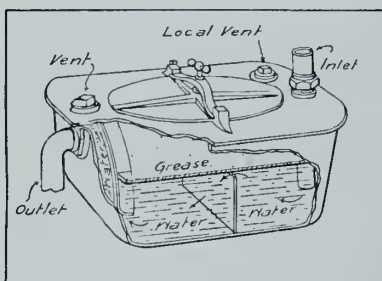


Fig. 1.—A grease trap made of iron.

the basin over a baffle plate, to the outlet, where it is discharged into the drainage system. It will be noticed that both the inlet and outlet connections to the grease trap are submerged, so that water flowing through will not disturb or break up the surface seum. A removable cover is provided, in all cases, so that the grease which accumulates can be periodically taken out; and vent connections are provided so the

basin can be ventilated locally and so the outlet connection can be protected from siphoning the contents out of the basin.

Locate Trap in Cellar.

Grease traps are used only in connection with the waste pipe from kitchen, scullery, or other sinks which have large quantities of greasy water discharged into them. The grease trap shown in Fig. 1, is intended to be placed under the fixture from which it receives the discharges, or, in case it receives the

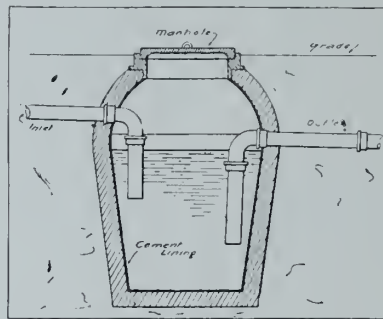


Fig. 2.—Brick grease trap set underground.

discharges from more than one sink, at some suitable place in the basement where it will be convenient to all the fixtures. As a rule, it is better to place the grease trap in the basement or cellar when it is possible to do so without locating it too far away from the sinks, because when the top is removed to take out the accumulation of grease the pungent odors will permeate the house if the grease trap is located on the living floors. On the other hand, if the grease trap is placed in the basement or cellar it must not be located too far away from the fixtures, or it will defeat the very object of its use. If located too far away the grease will deposit in the waste pipe before reaching the grease trap, which then will become practically useless.

In many cities where they have the separate system of sewers and the sewer pipes consequently are small, a grease trap is required wherever there is a kitchen sink. In such cases, the grease trap is often located in the yard just outside of the kitchen wall and is made of bricks laid up in cement mortar, and plastered on the inside with 1 inch of Portland cement as in Fig. 2; or the basin is made of cement concrete. In either case the grease trap is provided with a manhole and cover finishing flush with the surface of the ground so the interior will be easily accessible.

On account of the large body of water required to chill the grease, consequently the large size of grease trap necessary to install under ordinary conditions, the effort has been successfully made to chill the grease in a grease trap artificially and thus permit the use of smaller traps than would be required where the grease is chilled naturally. This is accomplished by means of what is called a water-cooled grease trap; and the principles of construction and operation of this type of apparatus is shown in Fig. 3. What would otherwise be an ordinary grease trap is enclosed in a water jacket, in such a manner that cold water can enter the space formed by the water jacket and circulate around the outside and below the bottom of the grease trap proper. The value of this arrangement lies in the fact that water is a far better conductor of heat than is air, and with a plentiful supply of water circulating through the water space, the contents of the grease trap will be kept down to as low a temperature as the water in the supply pipes to the building. This low temperature will chill the grease to the congealing point regardless of the volume of water in the trap and consequently a much smaller size trap can be used.

The Water Supply.

To insure a circulation of water through the water jacket of a chilling grease trap it is connected to some branch of the water supply to the building. The water supply pipe is connected to an inlet at the bottom of the water jacket and a flow pipe is extended

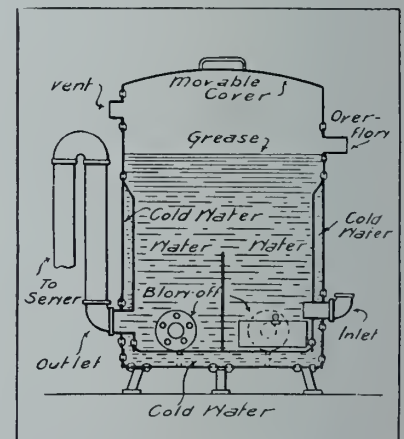


Fig. 3.—Blow-off connection at bottom.

from near the top of the water jacket to some fixture in the building. For the successful operation of the apparatus, the water pipe must be extended to some fixture which will be used frequently, otherwise the water in the water jacket compartment will become heated to the same temperature as the contents of the trap and will become useless. On the other hand, it would

not do to pass the supply to a drinking fountain through the water jacket of a grease trap for the reason that water at the drinking fountain is allowed to run continuously because, in that case, the water at the fountain at times would be too warm for use.

It is not necessary in constructing a water-cooled grease trap to extend the water jacket above the level of the contents of the trap. The air in the space above is well insulated from the waste water in the trap by the scum of grease which accumulates on top, and little or no good would result from the cooling process above the grease.

It might be well to mention that in buildings where the sink water is discharged direct into a large soil or drain pipe through which a large volume of water is constantly flowing, a grease trap will be unnecessary. In such cases the scouring action of the water, together with lye and soap in the sewage will go a long way toward neutralizing the effect of the grease, and besides, the agitation of the water will carry the grease along until it has congealed, when there will be little or no danger of it adhering to the walls of the pipe.

Water or Air Cooling.

Whether to use an ordinary air cooling grease trap, or a water cooled grease trap, is a question which must be decided in each individual case. As would naturally be expected, the water cooled grease trap being more complicated in construction than the air cooled grease trap, is much more expensive. Further than that, it is far more expensive to install, for besides the waste pipes, it must also be connected to the water supply. When the additional expense is no objection, however, and space is a consideration, the water cooled grease trap will be found preferable. When, on the contrary, the cost is an item of limitation and a bulky basin is not objectionable, the air cooled grease trap will fill all requirements.

A feature of the grease trap shown in Fig. 3, which will commend itself where the best is wanted, and cost need not be considered, is the blow-off connections at the bottom of the sewage receptacle. These outlets must be valved, and, when in use, the valves must be kept closed. Then when necessary to clean out the basin all that is necessary is to open the valve or stop cock, break up the scum of grease on the top of the liquid in the tank, stir up the sediment, and let the entire contents flow out through the blow-off connections. In order to thoroughly clean out the trap, the valves can be closed after the first flush is over, the basin filled with clear water from the sink and after thoroughly stirring up the contents, the liquid can be again allowed to run to waste.

This process can be repeated indefinitely, until the interior of the trap is perfectly clean.

Blow-off Outlets.

The blow-off connections from the grease trap may be connected direct to the house drainage system at any convenient point. There is no reason why such a connection is not permissible; after the grease once becomes congealed and is broken up into small pieces, there is little or no danger of it adhering to the walls of the pipe, but on the contrary will be carried by the successive flushes of water clear to the street sewer. To discharge the contents of the trap anywhere but in the drainage system would create a nuisance which would more than offset the value of the blow-off connections.

In valving the blow-off outlets, the better practice would be to use only ground-key cocks. If a valve were used for this purpose, either gate valve or

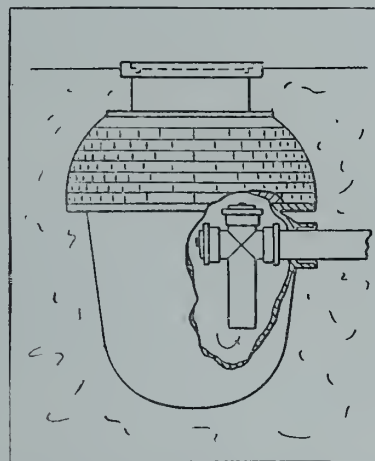


Fig. 4.—Underground trap with cast iron body.

globe valve, there would be no means of determining when it was completely closed and water might run continuously through the partly opened fitting into the sewer. If this should occur, it is plain to be seen that the value of the grease trap would be destroyed and the waste pipe would become filled with grease the same as though no grease trap were used.

(We would quite agree with what correspondent has to say concerning the subject of grease traps. There is one point which occurs to us, however, with which we believe he will agree. We think that under most conditions the use of the grease trap outside the house, such as shown in Fig. 2, is not as good practice as the use of such traps as shown in Figs. 1 and 3, for the reason that before entering such a trap the greasy waste must flow through a considerable length of cold pipe in the cellar and underground, which will usually

result in the depositing on the interior of the pipe of a considerable part of the grease present in the waste. Where this objection is absent such a trap is excellent, one reason being that it is kept cool at all times because of being buried underground. A patent form of such a grease trap, with cast iron body, is to be seen in Fig. 4.)

SMALL SIZE GAS PIPING.

The effect of gas piping that is too small was recently referred to in a paper read before a club of gas works operatives by Edward D'Aprix. In speaking of the difficulties experienced on account of old and unfinished house piping systems, the author explained that in each instance it was proved that the trouble was not with the gas but owing to the pipes being too small and filled with rust and scale. He mentioned systems which when cleaned were found to contain from a handful to a quart of rust, in some instances the accumulation of at least 50 years. One customer, he said, could not be convinced that the trouble was not in the gas until we took down his piping, cleaned it, and, by the satisfactory result attained proved to him that the trouble lay not in his gas, but in his lack of facility for taking it from his meter. He could then see that while he was getting his supply of gas from the same main as his next door neighbor, who has good light, that the trouble was in his own piping.

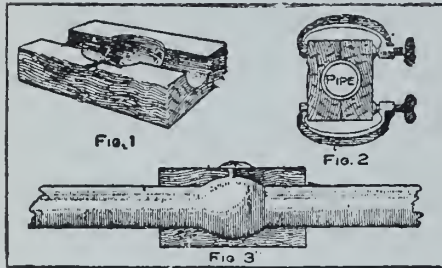
This trouble will always arise when too small pipes are used. In years gone by people thought as long as the pipes were large enough to supply gas that was all that was required, never taking into consideration the fact that they might add more openings for light or fuel, or that the pipes would gradually accumulate scale and rust which would decrease the flow of gas.

We have had cases recently of blowing out systems which have been in use a long period of time, the pipes being nearly filled with rust and scale, that by blowing them with air pressure have plugged the pipes entirely at some sharp bend or trap. It is always understood when we are asked to blow systems, generally the last resort, that the consumer takes the chance whether he gets gas or not. If you will take into consideration the cost of piping, as compared with the cost of other improvements of the same nature, you will find it does not pay to use too small pipe and fittings. When we furnish gas to the consumer under good pressure as far as the meter, our responsibility ceases; any fault in the system beyond the meter is up to the consumer.—Metal Worker.

SOLDERING JOINTS ON BRASS.

The method described in the accompanying cut shows how to make a soldered joint on brass, copper and lead pipe.

The pipe is cleaned and tinned, then placed in a mould made of two pieces of wood. One piece or one-half of the



New Method of Wiping Joints.

mould is shown in Fig. 1. The two parts of the mould are placed around the pipe joint to be soldered and held in position with clamps, as shown in Fig. 2, while the melted solder is poured through the aperture provided for the purpose at the top of each half section. Figure 3 shows the completed joint with one-half of the mould removed. Square-shaped clamps might be used to better advantage.

A FENCE SPRINKLING SYSTEM.

A substantial fence and a water sprinkling system are neatly combined in the accompanying illustration from Popular Mechanics. The fence railing is composed of a 1 1/4-in. water pipe, run through 6 by 6 in. posts, placed a few



Water Sprinkling System Combined With Fence.

feet apart. Valves are provided at intervals of 50 ft. and hose attached.

GOOD ADVERTISING.

W. H. Wiggs, of the Mechanics' Supply Company, Quebec, has written and published a most interesting booklet entitled "The Home, Beautiful and Healthful." As its name implies, the publica-

tion deals with the comforts of a home as directly influenced by the proper selection of its sanitary, heating and lighting appliances. Commencing with a warning as to the importance of having these necessary adjuncts to health and happiness of the highest type and workmanship, the author with the aid of numerous illustrations most novel and artistic in design, proceeds to describe in an entertaining manner the proper installation of modern heating appliances. He treats of the importance of the best system of plumbing, of the wise selection of bathroom utensils and accessories, the advantages of mosaic tiling, of art metal interiors, and of various lighting designs. Electric heating utensils are dealt with, as are also water heaters and other utility articles so necessary to the household. The importance of a well-roofed building is also mentioned. From the start to the finish of the booklet the reader's interest is maintained, and not only does Mr. Wiggs convey much useful information, but he illustrates the wide range of articles covered by the Mechanics' Supply Company and the comprehensive nature of the stock. Mr. Wiggs has solved the difficult problem of how to describe business while at the same time entertaining the reader.

WILLING TO SWEAR OFF.

Lewis Legrow, Toronto, the popular master plumber who sent in a decidedly original report to the recent M.P.A. convention at Montreal, recently thought he had something the matter with him and went to see a doctor. Mr. Legrow explained his fears, and the doctor looked him over.

"Now, Mr. Legrow," said the doctor,

"What is it?" quivered Legrow, who was a bit scared and did not know what he might have to promise.

"It is this," continued the doctor, impressively; "before I take your case you must promise me, on your word of honor, that you will stop smoking. No subterfuges. No cutting down. Stop right off. Quit drinking whisky, beer, wine and booze in every form. I exact that. Quit absolutely. Do you promise?"

"I promise," swore Legrow. "I promise faithfully. I have never drank in my life."

PUBLIC REST STATION UNDERGROUND.

One of the finest public rest stations in the country has recently been com-



Exterior and Interior Views.

pleted under Fountain Square in Cincinnati. It was constructed of concrete at a cost of \$25,000 and is entirely underground, the two views shown being taken from Popular Mechanics.

Ventilation is secured by means of two electric motors, one of which forces fresh air into the apartments while the other sucks out the impure air. The concrete construction work is entirely hidden by white tiling on the interior and the floors are covered with English red tile. The station is divided into two departments. The women's department contains a rest room and a woman nurse who has a miniature doctor's office equipment at hand. Three attendants are present at the station constantly.

The Saskatoon City Council has awarded the contract for the erection of the new fire hall to F. A. and G. A. Marr, at \$14,100.

NEWS OF THE TRADE IN CANADA

E. S. Coppins, Woodstock, Ont., plumber, gasfitter and electrician, is adding tinsmithing to his business.

Archibald Bros., New Westminster, B.C., have the contract for plumbing in the new firehall being erected there.

Currie & Livaek, Ottawa, are attending to the plumbing and steamfitting in the branch of the Bank of Ottawa at that place.

Saskatoon plumbers have been asked to tender on the installation of wash basins and drinking appliances for the High School there.

A new plumbing and heating shop has been started at Sydney, C.B., under the name of Farmer & Lewis. Both Messrs Farmer and Lewis are thorough mechanics.

The Burks Falls Hardware Co. has secured an expert plumber in H. Baker, whose work on several of the new buildings in that town is up-to-date in every particular.

George Pearson, Streetsville, who early in the year went to Toronto and opened a plumbing business, died at the home of his parents at Streetsville. Deceased was but 24 years of age.

Leamington has another plumbing and gas fitting business. Robt. Ross, who has had 18 years' experience in a number of Ontario towns, is the proprietor. He will also handle electrical work.

James Greenaway, master plumber, London, Ont., died recently, aged sixty-three years. Mr. Greenaway was born in Wiltshire, England, and conducted a plumbing business in London for over thirty years, up to the time of his demise.

F. Nelligan, of the Philip Carey Co., Montreal, has been in Ottawa superintending the insulation of the heating system in the Collegiate Institute there. This firm has also the contract for similar work in the new Y.M.C.A. building at Ottawa.

A business change has taken place in Port Arthur. L. Jones, of Connly & Jones, electricians, has purchased the interests of his partner, and will hereafter manage the business himself. Mr. Connly will remain with the business.

Bennett & Son, Gananoque, Ont., have a number of extensive plumbing contracts at Seeley's Bay, which they are finishing up at present. They also installed a bathroom and plumbing fixtures for Hugh Grey, a few miles east of Gananoque.

While at work in St. Andrew's Church, Guelph, William Dickson, an employe of Stevenson & Malcolm, who secured the contract for the installation

of the heating and plumbing, met with a severe accident. A heavy radiator fell on his foot, severely crushing it.

The Western Plumbing & Heating Co., Saskatoon, have now taken steps for the erection of a new block. The site was purchased some time ago. The building will be two storeys high. The ground floor will be fitted up as a show room, with workshop in the rear. Upstairs there will be a number of offices.

The reports from Ottawa plumbers and steamfitters indicate unusually good business. Owing to the mild weather remaining so late this fall, people refrained from giving attention to their heating apparatus, with the result that there is a super-abundance of jobbing orders to receive attention. People want the work done quickly and tradesmen experience difficulty in securing good workmen to enable them meet the rush.

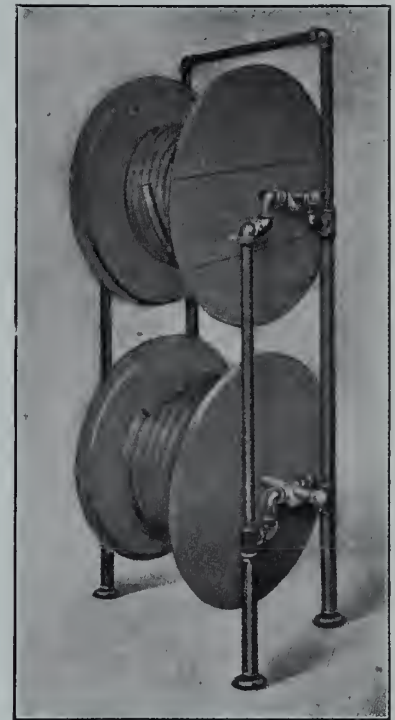
The plumbing and heating business in Charlottetown, P.E.I., is now booming. Bruce, Stewart & Co. have the following contracts on hand: Boiler and engine for the new Examiner office; installation of extensive heating apparatus in the Charlottetown Hospital; heating the Court House; heating the residences of W. B. Robertson, Edward Holman and Rev. E. J. McDonald; heating and plumbing of the new Bank of Montreal, and heating the Provincial Infirmary at Falcenwood.

At a recent meeting of the Brantford City Council a communication was read from the local plumbers' union, which took a strong stand in favor of a more adequate system of plumbing inspection in that city. It pointed out that under present conditions the local by-law as regards the inspection of plumbing was not properly observed. This was through no fault of the plumbers. In fact, they desired the fullest inspection. In this connection the communication urged that the inspection be made by a practical plumber and a thoroughly competent man. It was just as important, it was urged, that the plumbing inspector be a plumber as it was that the meat inspector be a veterinary man. The Council will look into the situation with a view to improving conditions.

LEAD PIPE REEL RACK.

A novel lead pipe reel rack is used in the store of the Oswego Hardware Company, Oswego, N.Y. The length of each of the four 1½-in. upright pipes to the first malleable tees is 1 ft. 3 in. These are secured at the lower ends by 1½-in. malleable floor plates. The 1-in. upright pipes extending from the first to

the second axle supports are 2 ft. 8 in. long, R. & L. thread. At the top of the front pipe, on each side of the rack, is a 1-in. R. & L. elbow and opposite, on each of the back pipes, is a 1½-in. malleable tee. The axle supports are made (commencing at each upright and extending to the axle) of 1-in. malleable elbows, 1x¾ in., bushings ¾ in., close nipples and ¾ in. cross over. The axles are ¾-in. pipe, each 3 ft. long, with lock nuts near the extremities and ¾-in. malleable caps on each end. The 1-in. upright pipes above the upper axle bearing are 1 ft. 8 in. long, on the top of



A Lead Pipe Reel Rack.

which are 1-in. malleable elbows, connected by 1-in. pipe, 1 ft. 10 in. long, with R. & L. threads.

DEVICE FOR ADJUSTING RADIATORS.

A very simple and handy device for leveling radiators, which for any cause whatever, have become uneven on the floor where they are standing, is a radiator pedestal made by the Jennison Plumbing Co., Fitchburg, Mass. This consists of a little iron block that extends or opens from an inch to two or three inches by simply turning the top piece, which piece is so cast that any radiator foot will fit securely upon it. A substantial screw holds the two pieces together and allows of the proper adjustment down to the thousandth part of an inch.

Catalogue and price list will be sent to anyone interested if this paper is mentioned.

CONTRACTS AND BUSINESS OPPORTUNITIES

General Building Notes.

K. Leck, Lethbridge, will build a \$2,500 residence.

Mrs. Scott will erect an apartment house at Toronto.

S. H. Chapman, Toronto, will erect a \$10,000 dwelling.

Mrs. Chas. May will build a \$12,000 dwelling at Toronto.

The C.P.R. will enlarge the Victoria offices of the company.

The Dominion Bank will erect a new branch at Fort William.

Victoria's building permits for September totalled \$53,630.

The Carter-Cotton building, Vancouver, will cost \$225,000.

A new building is being erected by A. Lunn, Asquith, Sask.

The Union Bank is expected to build a branch at Elstow, Sask.

A \$12,000 residence will be erected at Vancouver by P. Edwards.

Stratford's building permits for September were valued at \$15,020.

Vancouver's building permits for September were valued at \$313,755.

A new two-storey hotel will be erected at Coleridge, Alta., by Paul Lecieux.

A \$35,000 building is being put up at Vancouver by the Argyle Land Co.

W. G. Robinson, Toronto, will erect two pairs of dwellings to cost \$10,000.

F. Courtmanche will erect two pair of dwellings at Toronto to cost \$12,000.

Burke, Horwood & White, Toronto, will erect an \$18,000 apartment house.

Lawrence Solman will erect an eight-storey hotel to cost \$150,000 at Toronto.

J. H. Stanford, Toronto, will erect a number of dwellings at a cost of \$24,000.

Edmonton's September building permits were the largest on record—\$178,575.

L. P. Younger and W. J. Coblenz will put up business buildings in Altona, Man.

A permit was issued in Vancouver to A. M. Jordan, who will erect a concrete block to cost \$20,000.

A summer hotel will be built at Delta, Man., next spring. The Canadian Northern Railway have been asked to aid this project.

A. A. Frye, Saskatoon, is building a two-storey structure at Kinley. Part of the premises have been rented as a temporary school.

W. J. Ireland, Stratford, has prepared plans for a two-storey residence to be erected for J. D. McCrimmon. Estimated cost, \$6,000.

T. Lessard, Montreal, has been granted a permit for the erection of seven

pairs of semi-detached dwellings, at an estimated cost of \$13,000.

J. Fair, Montreal, will erect several stone and brick dwellings, at a cost of \$13,000. Shearer, Brown & Wills have the contract for the work.

Davidge & Lunn have been awarded the contract for the erection of a two-storey and attic dwelling at Ottawa for James Harris, at a cost of \$9,000.

A \$17,000 structure is being built at Vancouver for P. Burns & Company, and D. E. Hariss has taken a permit for a brick apartment house there.

The following are recent building permits issued at Brantford: John Berry, dwelling, \$1,000; Orie Myers, dwelling, \$850; Wm. F. Robertson, dwelling, \$300; William J. Scott, dwelling, \$1,200; Margaret Turner, dwelling, \$600; William Taylor, building, \$300; Geo. Bennett, dwelling, \$700.

Nine Canadian cities report substantial building increases up to the end of September. Halifax looms up with a tremendous gain of 937.78 per cent.; Fort William comes second, with 471 per cent., while Winnipeg records the smallest increase, which is 16.14 per cent. The other cities showing increases are Edmonton, Montreal, Quebec, St. John, Toronto and Windsor.

The building permits in the Fairview district of Vancouver recently were: W. H. Sparrow, house, \$1,800; Wm. Hogg, house, \$1,850; addition to High School, \$1,800; Elliott & Craig, cottage, \$900; Mr. Lough, house, \$3,500; W. A. Weaver, house, \$3,000; F. W. Smith, cottage, \$1,100; J. M. Reid house, \$1,800; J. W. Curran, house, \$2,500; J. Lawley, house, \$2,500; A. E. Thompson, house, \$1,500; C. B. Croll, house, \$2,300; D. B. Forester, house, \$3,000.

The new town of Elstow, Sask., on the C.P.R., is growing rapidly. A new hotel is at present under course of erection. A new flour and feed store is being built for W. S. Taylor. R. H. Smith is building a house. A feed mill and machine shop are being built. W. Neish has built a new house and is also making improvements to his blacksmith shop. J. Corestine has built an office adjoining his warehouse, and he is also excavating for a residence. Stewart Bros. contemplate erecting a larger store in the spring as the present one has been found to be too small for their increasing business. Several other residences of various sizes are in course of erection.

Public Buildings.

Another firehall is projected for Toronto.

A new post office will be erected at Walkerville.

An isolation hospital will be built at Moncton, N.B.

A new theatre building is proposed for Vancouver.

A public building will be erected at Emerson, Man.

A new school building will be erected at Tobique, N.B.

A new town hall will be erected at Dominion, N.S.

A public building will be erected at Plessisville, Que.

A new school building will be erected at Tynehead, B.C.

Ottawa South Methodists will erect a new \$6,000 church.

A new Hebrew Association Hall is being built at Winnipeg.

The C.N.R. and G.T.P. may erect a union depot at Edmonton.

The Berlin Orphanage building will be improved and enlarged.

A Greek Presbyterian Church will be erected at Radisson, Sask.

A site has been selected for the new R. C. Church at Radisson, Sask.

S. J. Kelley has the contract for building New Westminster's fire hall.

Funds are being raised for the building of a church at Brownlee, Sask.

A new brick school will be erected this fall at a cost of \$8,000 at Brownlee, Sask.

A \$50,000 wing will be added to the Free Hospital for Consumptives at Toronto.

G. J. Baetz, Berlin, will build the new \$18,000 church for Hespeler Presbyterians.

Plans for the new public school at Fernie, B.C., have been prepared by Robt. Kerr.

A new building will be erected by the Fernie Club at Fernie, B.C. Plans are now being prepared.

R. G. Bunyard, Moose Jaw, is preparing plans for a large new school house at Belle Plain, Sask.

Tenders have just been taken for the erection of a brick school for the Oliver school district, Strathcona, Alta.

The brass work for the new premises of the Imperial Bank at Ottawa is being supplied by Pritchard & Andrews.

Riddolls & Wright, Brantford, Ont., have been awarded the contract for the construction of an English Church at Cheweken, Ont., to cost \$7,000.

A temporary building, to cost \$2,000 will be erected for high school purposes at Yorkton, Sask. A large permanent building will be erected next year.

Dundas, Ont., promises a building boom. The Aged Women's Home, new High School, new Carnegie Library and a number of dwellings are among the works to be begun shortly.

A carload of heating fixtures has been unloaded for the new municipal hospital at Saskatoon, now under construction. This includes electric motor, blower, boilers and radiators. The fixtures will be installed by M. Isbister & Son.

A new heating system is to be installed in the Detention Home for Juveniles, Ottawa. The Board of Control has already had that matter before them, and the City Council will probably formally award a contract for the work.

Waterworks and Sewerage.

Lindsay will extend its sewerage system.

Cardwell, Ont., wants a waterworks system.

A sewerage disposal plant site has been chosen at Toronto.

The Thorold waterworks system is now in working order.

Extensions will be made to the waterworks system at Vancouver.

A successful test was made of Victoria's high pressure main.

Calgary proposes greatly extending its waterworks system next year.

The gas from Innerkip will be piped to Berlin, Plattsville and Hamburg.

Palmerston's waterworks system will be completed before winter sets in.

The Goat Mountain Waterworks Co. will instal a waterworks system at Preston, B.C.

Detroit capitalists purpose laying a gas plant proposition before Port Arthur and Fort William Councils.

A. W. Glass, Detroit, is asking Goderich for a thirty-year franchise for the establishment of a gas plant.

J. F. Connolly, Toronto, has secured the contract for building a large sewer in Welland, estimated to cost \$51,000.

The Winnipeg Board of Control have awarded the contract for a sewer on Pacific Ave. to Dobson & Jackson, at \$1,817.

The contract for extensions to the Quebec waterworks has been awarded to the Rexford-Bishop Company, at \$21,813.

In order that the sewage from the city may be properly taken care of another septic tank is necessary at Guelph, and one may yet be erected this year.

Dr. A. Groves, Fergus, has written to the Fergus Council stating that for a thirty years' franchise he would instal a waterworks plant in that town.

A new waterworks by-law whereby petitioners will be able to obtain water and sewerage connection on request will be submitted to Lindsay ratepayers in January.

A highly successful test of the new

wells at the Listowel waterworks was made recently, the flow of water from the wells being even greater than was expected.

W. E. Skinner proposes spending \$1,000,000 in establishing a steam heating system in Winnipeg if the Council grants him permission to lay pipes in the streets.

Galt & Smith, Toronto, have prepared a report for the Tottenham Town Council on a possible waterworks system. The scheme, if adopted, would call for an expenditure of \$25,000.

The Chatham Water Commissioners at a recent meeting discussed the project of extending the water mains to every part of the city. The completion of mains will, it is estimated, cost \$10,000.

Two money by-laws were voted on recently at Orillia. One of \$10,000 for waterworks extension, carried by 111 majority. The other, \$30,000, for the completion of the power plant, carried by 126 majority.

The Hespeler Town Council has let the contracts for the fire protection pipe line. The excavating and back-filling will be done by the Concrete Engineering and Construction Co., Toronto, and the pipe and castings by the Gartshore-Thompson Co., of Hamilton.

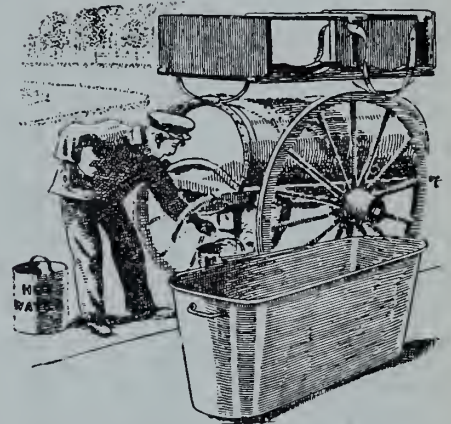
There has been some trouble with the wooden pipes laid some time ago on River Street, Prince Albert. They have proved unsatisfactory, owing to the big water leakage, a metre test showing it to be as much as 25,000 gallons a day. They will be replaced with iron pipes.

The citizens of Prince Albert have voted by-laws amounting to \$52,400 for the extension of sewer and waterworks and a new firehall. The expenditures are \$26,000 for waterworks and house connections and \$19,000 for sewer extensions.

PEDDLING BATHS IN PARIS.

There is plenty of water in Paris and quantities of it are used on the streets by men with lines of hose made in metallic sections, with flexible joints, each section mounted on wheels. But it is almost impossible to get water above the street level, and quite impossible to get any quantity of it hot under normal conditions, says "The Technical World Magazine." Only a few of the very newest houses in Paris have water above the street level. This is true of hotels as well as private houses. A hotel keeper may send up a quart of hot water to your room, but filling a tub would probably be beyond the capacity of the establishment. Many Parisians bathe in big bath houses which

line the Seine. In places these houses occupy a greater part of the river. But if a Parisian wants a hot bath at home he turns to the peripatetic bath tub. This originates in a bathing establishment, of which there are many. The bath peddler, as he leaves his establishment, has two straps over his shoulders and he stands between the shafts of a two-wheeled cart. On this cart is a tank, surmounted by a substantial bath tub, provided with castors. In front of the tank hang two large metal buckets and a yoke. The bath man draws this apparatus through the streets to your home. When you want a hot tub, you order one delivered at a fixed time. The bath man comes around with his apparatus, stops in front of your house, lifts the tub from the top of the tank, puts it over his head like a hood and carries it upstairs to your room. Returning to the street he draws hot water in the buckets, hangs them at each end of the yoke which he carries across his shoulders, and so conveys water to the tub. When



How Parisians Bathe.

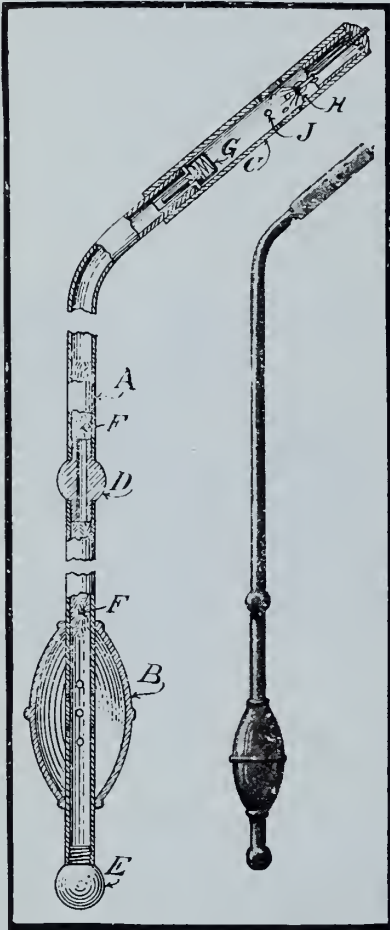
the tub is full he retires and you take your bath. Then he comes upstairs, empties the tub by means of his buckets and carries the tub and buckets away. His passage through the streets is an everyday sight to the Parisians and arouses no comment.

THE PLUMBER'S DERBY.

The compassionate citizen remarked to his plumber: "Gus, if I were a plumber and had to crawl into small nooks and corners, as you do, I'd wear a soft hat or cap. Why, your derby is full of dents." Gus replied: "I'd be a fool to wear a soft hat. This derby hat saved my head many a hard knock from pipes and beams. See, I have it packed with crumpled newspapers, which give me both inspiration and immunity."

AN AUTOMATIC GAS LIGHTER.

Pictured in the accompanying engraving is a gas lighter of portable type, in which a flame is created at will by directing alcoholic vapors to a catalytic igniter. This is done in such a manner as to effectually prevent the possibility of an explosion or ignition of the vapor in the reservoir of the lighter. One of the figures shows a sectional view of the device. It consists of a tube A, provided at its lower end with an air bulb B, while at the upper end is a cap C, in which the catalytic igniter is suspended. The tube A consists of two members, which are connected by a coupling B. The lower end of the tube is closed by a plug E. At each side of



An Automatic Gas Lighter.

the coupling D the tube is stored with absorbent material, saturated with alcohol. The bulb B when compressed forces air into the tube and through the absorbent material, and the air becomes saturated with alcoholic vapor. The upper end of the tube A is closed by a valve G, which opens against the tension of a spring when the alcoholic vapor is forced upward by operating the bulb. The vapor, passing through the valve D, comes into contact with a bunch of fine platinum wire, which possesses the property of becoming highly heated when exposed to gas. Thus, the gas is ignited and issues from the open-

ings J in the form of a flame. The valve G closes as soon as the air and gas are forced past it, so that when the bulb B expands, it is impossible to draw the flame down into the reservoir of alcohol, and thus an explosion or ignition in the reservoir is avoided. The inventor of this lighter is Lewis B. Prahar, 124 Pearl Street, Brooklyn, N.Y.

LIQUID SOAP NOVELTY.

Chas. Morrill, 277 Broadway, New York, has brought out and placed upon the market a sanitary device called the Soapurn for the storing up of and economical distribution of liquid soap. It consists of a strong glass urn supported by a bracket to either the washstand or wall, having a locked cover, and at its lower end a discharge valve made of non-corrosive metal.

The cover consists of a metal cap which locks into grooves in the glass. The opening is large so as to permit easy access to the inside of the glass vessel.

The lock is a very simple arrangement, having no springs. It cannot break or get out of order, and can only be operated by a special key.

The reservoir or urn is glass, and the valve parts are nickel alloys which will neither rust or corrode.

The valve is simple and positive and does not depend upon gravity for its action. It has only one moving part and cannot break or get out of order. The soap enters the upper part of the valve and when the piston is pushed up, runs down below it, then as the pressure of the hand is released and the piston allowed to come back, it forces out into the hand a couple of drops of soap. As it takes from five to ten drops for an average wash, depending upon the condition of the hands, it is necessary to operate the plunger several times in order to get enough soap. It would be just as easy to so design the valve as to get enough soap at one operation but it is a well-known fact that persons, particularly in public places, will operate a device like this a number of times regardless of how much they may get at one operation, so that this device has been purposely designed to throw only a small quantity and so eliminate this wastefulness. At no position of the plunger will a steady stream flow. Most other containers throw from ten to thirty drops at one operation, so that the great economy of the Soapurn is readily understood.

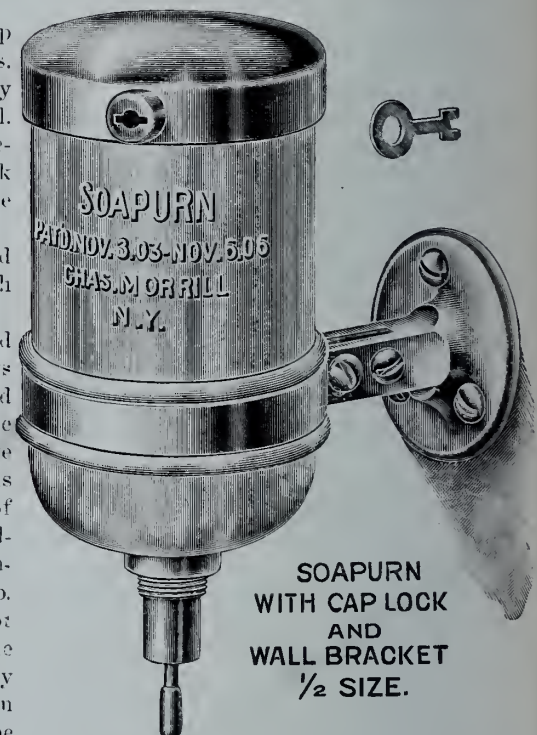
The Soapurn should be placed so that its discharge orifice projects over the bowl, about two inches from its edge. Thus any drip from wet hands when using will be automatically taken care of. The discharge button is as small

as possible and is placed at the very lowest end of the Soapurn, thus avoiding any drip over the Soapurn as the hand is always below the urn. These features, together with the absence of a soap dish, make a perfectly clean wash basin and surroundings at all times.

All parts have to be put on and taken off with a special made key or spanners; all bolts used are made a little longer than necessary so that they may be clinched, if so desired. These features render it very difficult for anyone to tamper with the Soapurn.

The foolproof, hygienic and economical qualities of the Soapurn especially recommend it for use in all public places.

Liquid soap is a more powerful cleanser than any other form of soap, not because it is stronger, but because, be-



ing liquid, it gets into the pores of the skin and expels the dirt, whereas hard soap simply glosses the pores over. It is more hygienic than cake soap because every user gets an individual wash with a fresh supply of soap which has not been touched by any previous user and which has not, as in the case of cake soap, got its surface covered with repulsive dirt, and in many cases, with malignant germs.

As liquid soap can only be made from the best vegetable oils it is equal in quality to the best cake soap made, while in price it is cheaper than the cheapest of toilet cake soaps.

The Soapurn is furnished in several styles of cover and brackets. Each Soapurn is carefully packed in a cellular box for shipment with full directions for setting up and use.

PLUMBING AND HEATING MARKETS

MONTREAL.

October 26.—Trade is of a healthy character. Orders are coming in freely in all lines, and if the progress is kept up the month to many concerns will be a better one than the same period last year. Despite the approach of Winter the foundations of many houses are being put in, and it looks as if the work will be carried right on despite the drawbacks of severe weather. As a result of this, soil pipe is continuing to move well, while other lines are being stimulated by the completion of the houses that were started in the early part of the Fall. Transactions in the realty market have been very active recently, probably more active than at any other time during the year. This looks promising for future building. The reconstruction of Three Rivers, which will start in earnest next Spring, is looked forward to with interest by supply houses. The town will prove a happy hunting ground for a good many firms.

Although work is not so evenly distributed as it might be, some plumbers having more work than they can do, while others not enough to keep their men busy, the majority seem fairly well satisfied with conditions.

IRON PIPE—Satisfactory business continues to be done. The country demand has improved, and apparently users are stocking up a little. The city demand has felt the influence of the continued activity in the building trades. Iron pipe is unchanged in price, and so are most of the fittings.

SOIL PIPE—The starting of so many new houses recently has stimulated the sale of soil pipe, and both the city and country demand is good. Users' stocks are so light that the slightest stimulation is felt at once right through to the manufacturer. There is no change in prices and the market is firm. We quote:—Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Lead pipe is going out well, the Autumn building calling for a good supply. Pipe and waste are still quoted at 30, and traps and bends at 50.

SOLDER—The demand for solder is improving. The activity of jobbing orders has much to do with this, shops looking after this kind of work usually not keeping large stocks. Solder is unchanged in price, and we quote 19c for half and half, and 18c for wiping.

ENAMELWARE—The market keeps firm in the best class of work. Enamelware is going out well, although the rush noticeable some time ago when jobbers' stocks were low, is not now showing.

BRASS GOODS—The demand continues to improve. There is very little change in prices in the best grade of work.

RADIATORS AND BOILERS — All heating lines are in good demand now and the business for the month promises to be much better than in the same period last year. We continue to quote: Radiators, at 52½ and boilers at 50 and 10 off. Steamfittings are 66 2-3 off, with a good demand.

METALS—There has been very little change in the metal market, and quotations are unchanged. Good business continues to be done in Canada, although the same cannot be said of other countries. We quote: Ingot copper, \$14.25; ingot tin, \$32.50; lead, \$3.60; pig iron, Middlesboro No. 1, \$18.50 to \$19. Summerlee, \$20. Heavy scrap red brass is 10¼c; light copper, 10¼c; heavy lead, 2¼c.

TORONTO.

October 31.—Jobbers report satisfactory trading being done in the cities and large towns, though the country trade is not so good as during the month past. No doubt the near approach of Winter is hurrying along the closing in of new houses to permit of inside work being pushed and master plumbers have pretty full staffs at work installing new plumbing. Country plumbers have in their stocks for the Winter trade. The orders this Fall were not so large as in past years, but were fully as numerous as ever.

There is a reduction in brass goods prices, or rather a second grade of brass goods at lower prices is being offered by Toronto jobbers. Both fuller and compression work are down and a reduction is made in some makes of valve. Enamelware is not going out so quickly as during the earlier weeks of October, and jobbers are not having the difficulty in getting supplies they did even two weeks ago. Still business is very good. A new list on Port Hope goods is expected shortly, though quotations still remain at the old figures.

BRASS GOODS—This line has been a slow seller all Summer and to induce buying some cutting has been done by one or two firms. Now all jobbers quote a lower price on certain lines. For instance, standard compression work is now at 70, though some high grade work remains at 65 per cent.; fuller work is now 75 and 10 instead of 70; and No. 0 basin cocks are 80 p.c. A new basin cock (No. 2) is at 75 and 10 p.c. Flatway stop and waste cocks are 75 p.c., instead of 60 and 10, and roundway remain at the old figures. Compression bath cocks (No. 4) are down 20 cents, being now quoted at \$1.50; and

No. 4½ Fuller's are 1.85, a decline of 25 cents. Fuller bibs are 75 and 15.

ENAMELWARE—Though quotations remain at the old figures there may be a slight change shortly, when new lists are issued. It was thought earlier in the season that enamelware would advance, but now it is anticipated there will more likely be a decline or a higher grade offered at present quotations.

IRON PIPE—Fair business is being done. Old quotations rule. 1-in. black is \$5.11, and 1-in. galvanized is \$6.76. Cast iron fittings are 65 and 70 per cent.; flanged unions are 55; nipples 70 and 10; malleable lipped unions 55. Malleable fittings are unchanged at from 35 to 37½ per cent. off.

SOIL PIPE—Except for services being laid to old-style houses not much business is being done. Prices are unchanged. Light pipe is 60 and fittings 70 per cent. Medium and extra heavy pipe and fittings are 70 per cent.

LEAD PIPE—Traps and bends, 50, and pipe and waste, 30 per cent, are the prevailing prices, continued from the Summer months. Trading is fair. Calking lead is at from 4½c to 5c per pound.

SOLDER—Wiping solder is at 18½c and half-and-half, 19½c, which prices are slightly firmer than in the past few weeks. Demand is good and supplies while not great in stocks are sufficient for present trading.

BOILERS AND RADIATORS—Heating goods are being rushed out. This month is expected to see a dropping off of orders, but factories will be kept busy getting out next season's stock. Prices are the same as the quotations ruling all Summer, manufacturers having been unable to agree on a desired change.

Condensed or "Want" Ads.

PERIODICALS.

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MISCELLANEOUS.

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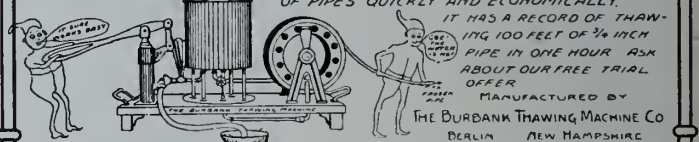
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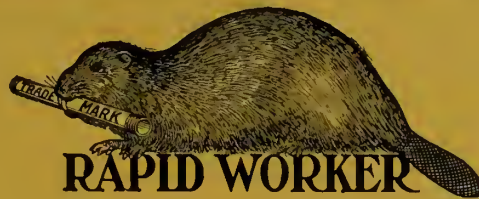
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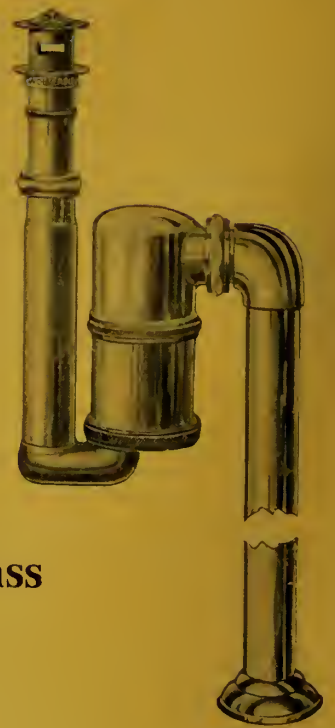
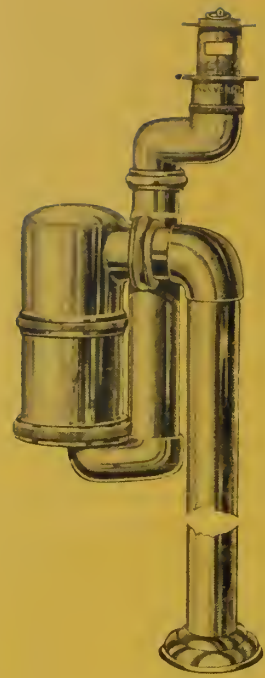
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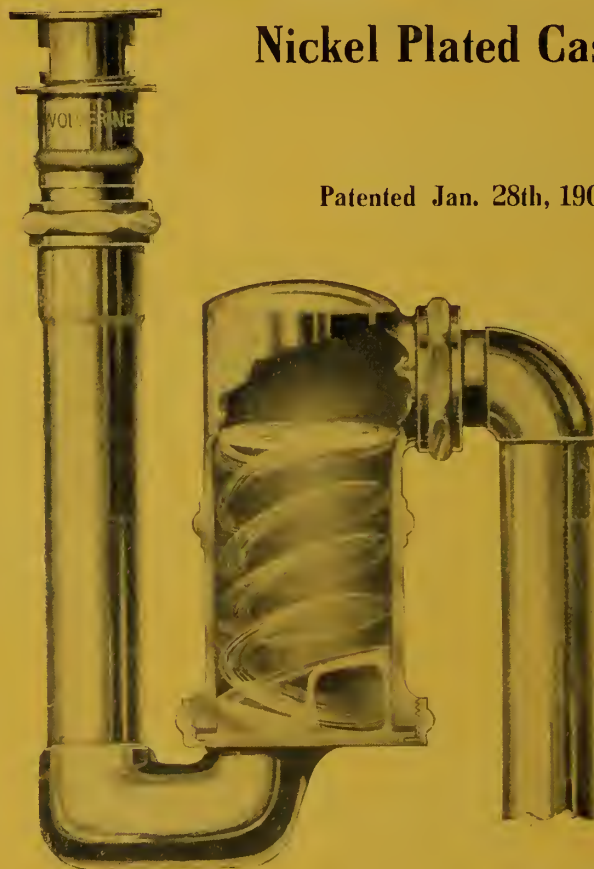
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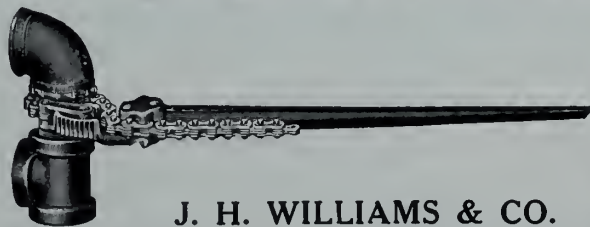


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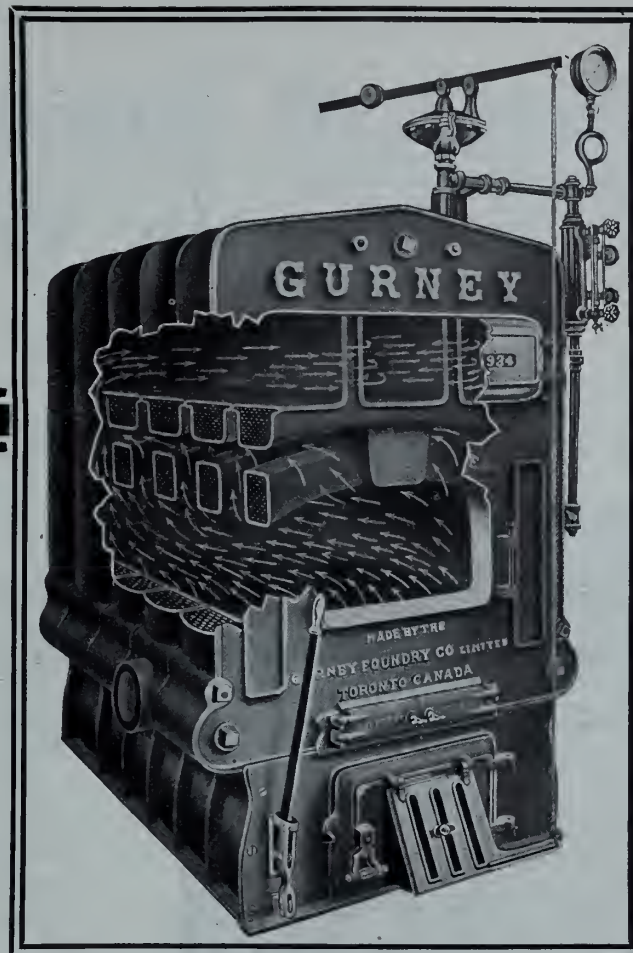
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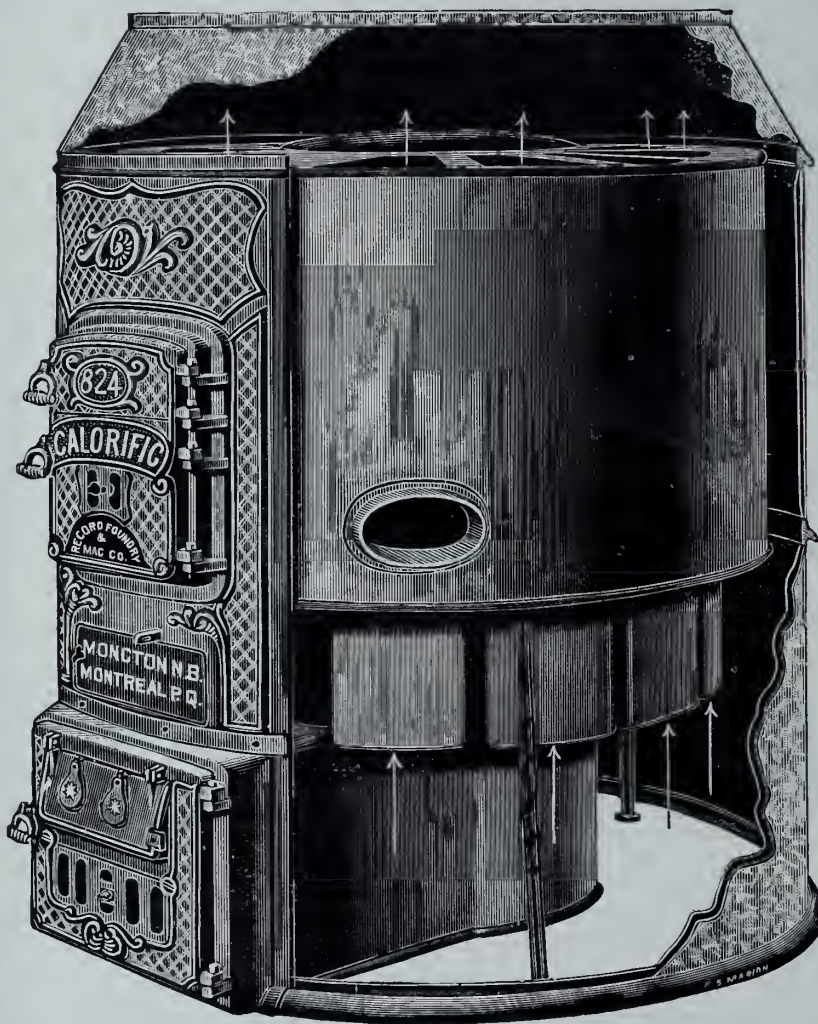
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MONTREAL, TORONTO AND WINNIPEG, NOVEMBER 16, 1908

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Legislative—H. A. Knox, Ottawa.
Apprentice—James Griffin, Montreal.
Essay—H. L. Chandler, Ottawa.

PUSHING WORK OF ORGANIZATION.

Organization matters in Ontario have begun to move and an interesting winter's work seems in prospect.

In response to Vice-President Cooper's letter in *The Plumber and Steamfitter* of November 1, a letter is reproduced on the correspondence page, Mr. Russell, the writer, suggesting as one desideratum, "that the membership in the association be limited to one-half the trade in any one city." Mr. Russell does not advance any arguments on this point, but his suggestion might be discussed to advantage and letters on this and any other phase of the subject of trade organization will be published. This membership problem is probably confined to the large cities, however.

In Toronto the number of registered plumbers has increased in the past six months from 247 to 287, and many plumbers and fitters are doing plumbing jobs without bothering about paying the paltry license fee of one dollar. A couple of years ago the registration amounted to only about 120. From this it will readily be seen that business is badly cut up in Toronto, as most of the new men are journeymen inexperienced in business methods.

The Toronto Master Plumbers' Association, however, is tackling the question of organization, and Andrew Mann, formerly of the Mann Brass Works, London, has been engaged as organizing secretary, and it is hoped that the membership of about 40 will be increased to over the

hundred mark by the end of the year. The Ways and Means Committee have interviewed Dr. Sheard regarding the drafting of a new plumbing code for the city, and the Medical Health Officer has expressed a desire to receive suggestions from the plumbers' and architects' committees. A conference will, therefore, be arranged with the architects on the subject.

Outside of Toronto, master plumbers in Guelph, Berlin, Brantford, London, Windsor, Fort William and other places have expressed themselves in favor of organizing local and Provincial associations, and while the job is a big one, it looks as though success will follow the efforts made.

H. W. Munday, Montreal, Secretary of the National Association of Master Plumbers, is also continuing his active campaign on behalf of the Association, and has sent copies of the following letter to the different vice-presidents to be distributed among the plumbers of their respective districts. The letter is terse and to the point, and should do a lot of good.

On behalf of the National Association of Master Plumbers of the Dominion of Canada, I wish to advise you of the existence of a local association in your Province, and we wish you to join us. In joining us you have nothing to lose and everything to gain. You know that the plumbers are the most despised mechanics in the world. Why? Because we have no organization to fight against false statements that are made against us. Let us be somebody! Let us get together where we can control an honest day's pay for an honest day's work.

In getting in touch with the vice-president for your Province he will gladly give you any information you require about the rules and by-laws for the local association.

WON'T ALLOW MAIN TRAP.

John W. Farrell, plumbing inspector, Salt Lake City, says that city abolished the main drain trap over ten years ago. "We have a clean, straight, 4-inch opening from the sewer 'Y' to 18-inch above the roof, and the draft upward would blow out a lighted candle, if it were held at the opening on the roof," he writes in *Domestic Engineering*.

Rule "C" in the Salt Lake City plumbing code reads as follows: "No trap or any manner of obstruction to the free flow of air through the whole course of the drain and soil pipe shall be allowed, and any plumber who shall, directly or indirectly, place or make any trap, contraction or other obstacle anywhere in the course of such drain or

soil pipe, shall, in addition to the penalty herein prescribed, forfeit his license, and shall be ineligible to re-license for one year. Any person violating this rule shall be subject to the penalties of this chapter and shall in addition pay the cost of rectifying the wrong done."

This paragraph shows what would happen to a plumber who would undertake to use a drain trap or any other kind of a contraption in the whole course of the drain or soil pipe. Besides the penalty quoted in "C" there is another of \$100 fine and 100 days imprisonment, one or both, the judge to decide.

WATER STERILIZED AT THE TAP.

Ozone is one of our most powerful oxidizers, and advantage has been taken of this fact in a novel manner in France. Drinking water, though passed through a lengthy cycle of filtering and purifying operations, may be extensively contaminated by micro-organisms. The latest development is the introduction of a certain quantity of the gas into the water at the tap, so that when drawn, the liquid is to all intents and purposes perfectly sterile. The apparatus is very simple and inexpensive to instal. Mounted on a small panel some fifteen inches square is a small ozonizer, comprising sheets of glass covered with tinfoil on one side, and freely perforated. A current of air is drawn through these plates, which is ionized under the influence of the electric current. The ionized air passes into an inverted glass bulb into which the water is thrown by the main pressure in the form of a spray, and accordingly it combines with the gas, which immediately seizes upon all bacteria present, oxidizing or despatching them immediately. The water drawn from the tap is quite germ-proof, while the addition of the ozone imparts a delightful sparkle and an invigorating taste to the liquid. The apparatus is very economical in operation, the ozonizer merely being connected to the holder of an electric lamp, while the simple task of turning the tap sets the ozonizer in action, switching off the current when the supply is arrested. The electrical consumption is very small, one unit sufficing for the sterilizing of a thousand gallons of water. Over a thousand of these sterilizers have been installed in private houses in Paris, and recently they have been introduced in America. The system has also been extended to the purification of public supply instalations, a huge plant having recently been completed for the sterilization of the drinking water of Nice before its entry into the distributing mains, a plant capable of treating over five million gallons of water per day.

On another page in this issue a description is given of the ozone purification plant just completed at Lindsay, Ontario.

THE SEWER GAS QUESTION.

David Craig, Boston, the former Canadian, who was national president of the master plumbers, and chairman of the sanitary committee of the association, recently conducted an investigation on the question of sewer gas and read a lengthy and valuable paper on the subject before the last annual convention.

Mr. Craig also spoke on the subject before the members of the Massachusetts Association of Boards of Health at their quarterly meeting on October 29. Prof. Winslow, of the Institute of Technology, who assisted Mr. Craig in his experiments and in preparing his paper for the plumbers' convention, was also a speaker. Prof. Winslow went into detail as to the nature of the many experiments conducted by him and Mr. Craig. He announced it as his opinion, after an exhaustive study and investigation, that although to a limited extent bubbles and splashing can throw bacteria from the sewage into the air, it can only do so in

such quantities that to breathe such sewer air for a period of 24 hours would put less bacteria into the system than would the drinking of water supplied by the city of New York.

Mr. Craig told the members of the Boards of Health what the National Association of Master Plumbers has been doing to get a true and exhaustive scientific study of sewer air and its relation to the spread of certain diseases. He said that the association planned to publish its findings and those of the scientists engaged in the work.

Speaking of modern plumbing, Mr. Craig said that in his opinion it is far more expensive than is necessary and that the house beams are frequently weakened to accommodate much of it solely because much of it is installed in accordance with regulations founded upon ignorance of the true character of sewer air. No plumber ever invented the modern closets, he declared, for a plumber is taught first of all to avoid joints and bends in piping. From the standpoint of a plumber he believed the freer the flow from basin to sewer the better.

DEATH IN SCHOOL DRINKING CUPS.

The greatest achievement of science in the opening decade of the twentieth century, says the Technical World, is the awakening of the people to the fact that most human diseases are preventable, and a large proportion of early deaths avoidable. At least 700,000 of the million and a half deaths occurring annually in the United States result from the minute parasitic plants and animals gaining access to the body. These invisible foes wage a continual warfare against both strong and weak, rich and poor. Civic duty, as well as self-preservation, demands that these life-destroyers should so far as possible be shut out of the human system.

The evidence condemning the use of the common drinking vessel upon any occasion whether at school, church or home, is derived from these sources: 1, the frequent presence of disease-producing bacteria in the mouth; 2, the detection of pathogenic germs on the public cups; and, 3, the discovery that where a number of people drank from a cup previously used by the sick, some of them became ill.

A cup which had been in use nine days in a school was a clear, thin glass. It was broken into a number of pieces and properly stained for examination with a microscope magnifying 1,000 diameters. The human cells scraped from the lips of the drinkers were so numerous on the upper third of the glass that the head of a pin could not be placed anywhere without touching several of these bits of skin. The saliva by running down the inside of the glass has carried cells and bacteria to the bottom. Here, however, they were less than one-third as abundant as at the brim.

By counting the cells present on fifty different areas on the glass as seen under the microscope it was estimated that the cup contained over 20,000 human cells or bits of dead skin. As many as 150 germs were seen clinging to a single cell, few cells showed less than ten germs. Between the cells were thousands of germs left there by the smears of saliva deposited by the drinkers. Not less than a hundred thousand bacteria were present on every square inch of the glass.

Master plumbers, by bringing these facts to the attention of their fellow citizens, through the local papers, can do much to create a sentiment in favor of abolishing the out-of-date drinking cups from the public schools and the substitution in their stead of the modern disease-preventing drinking fountains. Ask your editor to reprint the above article.

Municipal Ozone Purification at Lindsay

First Municipal Ozonizing Plant to Treat Entire Water Supply of a Town on the American Continent—Constructed Under Contract With Lindsay, Ont., by J. Howard Bridge, the Inventor and Patentee.

This new plant, erected in connection with the pumping station, is completed and in running order. The total cost of the plant with a capacity of 1,500,000 gallons, including pre-filter, is \$7,250. The cost of operation is 8 h.p., for which the town pays \$35 per h.p. per year. This equals \$280 for the treatment of 547,000,000 gallons yearly, or 51 cents per million. The plant is being operated by the regular employees of the pumping station.

Besides breaking all waterworks records for cost of instalation and economical operation, Mr. Bridge broke all records for rapidity of construction, which in the purification of a public water supply is of almost equal importance. Mayor Begg, of Lindsay, turned the first sod on August 24th. The plant, including a pre-filter of reinforced concrete, was completed and in operation on October 23rd—a little over eight weeks.

The ozone-purification plant is located at the city pumping station, on the banks of the Scugog River, from which the town supply is taken. The Scugog is a sluggish stream running from a shallow lake of the same name into Sturgeon Lake. The water is strongly charged with vegetable matter derived from the lake and surrounding swamps, and this, besides affording a rich pabulum for bacteria, imparts an unpleasant odor and taste to the water. As a result the citizens have had recourse to well-water, which in itself has not always been above suspicion, and typhoid fever has been quite prevalent in the town.

Prior to the instalation of the ozone plant a rough and ready sort of filtration was practiced, which did little more than strain out the grosser particles of suspended matter. The new system includes a modern rapid filter of reinforced concrete, a sterilizing well forty feet deep and about six feet square, and a purified water basin from which it is pumped directly into the mains of the town. The system is so contrived that the water passes entirely by gravity from the river through the filter and sterilizing well to the suction pipes of the pumps; while in the electrical part of the plant there is a similar absence of mechanical means, so that with the exception of a small blower of $\frac{1}{2}$ h.p., used only when the river is low, there is not a wheel turn-

ing anywhere. By an ingenious automatic device the graded opening of a single valve admits varying quantities of water to the apparatus as required by the needs of the town. At ordinary times the pumpage is five hundred gallons a minute. During fires this may be doubled; in either case the rate of filtration and ozone sterilization is simply regulated by the operation of a raw-water valve, and no other attention is required. So, too, when the pumps are completely stopped, provision is made by which the ozone produced is automatically drawn from the ozonizers, so that these may safely run continuously should the attendant ne-

cleaned by simply reversing the current, the wash water coming from the city main under a pressure of 60 to 100 lbs. to the square inch. The cleansing process occupies about three minutes, and is practiced every day when the river is especially foul. At other times the filter may run several days without washing. The waste water after washing the sand escapes into the river through two eight-inch pipes furnished with check valves. After rough filtration the water under treatment flows through an eight-inch pipe into another chamber, in which its height is automatically regulated by a butterfly-valve and float. Here it passes into an



Ozone Tubes Before Being Placed in Position.

glect to turn off the electric current supplying them.

Details of Plant.

A twelve-inch pipe leads from a crib sunk in the river to a raw-water basin holding fifteen to twenty thousand gallons. From this the water passes into a rectangular tank of reinforced concrete, some 12 feet by 15 feet, where it passes through three feet of coarse sand to strain out the suspended matter. This sand is brought from Birmingham, N.J., 31 tons being required for the Lindsay plant. The pre-filter is

air-tight box built of concrete, which is directly connected, by means of a two-inch pipe, with the ozonizers, in a small building adjoining. The water now falls down a number of four-inch pipes leading to the bottom of a well, thirty feet deep, and in doing so passes the ends of a great many small brass tubes, through which, by suction, the ozonized air is drawn and thoroughly mixed with the water. An arrangement of baffle-plates prevents the too rapid escape of the ozonized air from the water, and the two fluids, thoroughly co-mingled, flow slowly up the well

into a pure-water basin, where the now-exhausted ozone separates from the water. When thus freed from the purifying gas the water is allowed to pass to the suction pipes of the pumps, which send it at once through the city mains and to the stand-pipe.

The ozonizers occupy a brick building only 8 feet by 10 feet, built against the pump-house. They consist of two iron boxes, each containing twenty-six separate units. Each unit has its own fuse, so that, if by any chance, a short-circuit should occur, the unit affected would be the only one to go quietly out of commission, while the remainder would continue operative. These units are so constructed that a workman can remove or replace them in a few moments.

The city current is brought into the building at 1,010 volts, and is raised by

refrigerating machine, or even of installing any of the chemical dryers used elsewhere. It is by the cutting out of an air-pump, which costs twice as much to operate as does the ozonizer, and the elimination of an air-dryer, that the Howard Bridge system has demonstrated its superiority to that tested by the officials of New York City, who showed that the cost of ozone in water purification is only 25 per cent. of the whole, the remaining 75 per cent. being used up by the air-pump and refrigerating machine.

In regard to the efficiency of the Lindsay plant, it is believed to have met the chief conditions called for in the contract made with the town—that the plant “will successfully purify to an absolutely safe extent, from a sanitary and public health standpoint, the water to be supplied through the said

bactericidal properties of ozone have been so abundantly demonstrated as now to be accepted as a matter of course. An elaborate series of bacterial tests are about to be conducted at the Lindsay plant by Dr. Amyot, official bacteriologist of the Province of Ontario, which will be made public in due time. In the meantime the eyes of sanitarians and hygienists throughout the United States and Canada are directed to this first municipal ozone purification plant on the American continent, which, if it fulfils its present promise, may revolutionize all accepted ideas of the purification of public water-supplies and its costs.

The filtration plant was installed by J. G. Sharpley, M.E., Philadelphia. In one view is shown the two ozonizers with their transformers. The cover has been removed from the one on the left and the construction may be seen. The electrified plates are filled with holes,



Sterilizer is in Larger Circular Well, Pre-filter in Rectangular One.



Ozonizers—One With "Glass" Removed.

step-up transformers to 10,000 volts. Each of the two ozonizers has its own transformer, and independent air inlet and outlet, so that they may be operated together or separately. The air is sucked into the apparatus by the movement of the water through the sterilizing well, and no air-pump is used, as is the European custom. Nor, contrary to European usage, is anything done to free from moisture the air admitted to the ozonizer. Mr. Bridge has found that while a larger output of ozone results from drying the air admitted to the ozonizer, the difference is not enough to justify the cost of operating a re-

waterworks system, and will remove all objectionable color, taste and smell from the said water, and will destroy all germs or constituents which shall prove dangerous or shall be liable to prove harmful to the health of the people using the same, and shall be bright and clear and palatable to the taste, and shall not be rendered in any way injurious to the waterworks system, or the piping thereof by reason of passing through the said process." The effluent of the plant is clear, bright and palatable, and it is free from objectionable color, taste and smell. Presumably it is also free from noxious germs, as the

not perforated, but such as would be made with a punch. These plates are separated by mica, the air is drawn in and must pass through the holes in these plates. The ozonized air passes through pipes at the back and passes through the water as mentioned above.

Another shows the ozone tubes before being placed in position. In the background may be seen the small addition that was necessary to add to the pumping station for the housing of the ozone generators.

Look out for the man with a get-rich-quick scheme. A ton of coal will make just so much steam, and it won't make any more by burning it all at once,

SEPTIC TANK SEWAGE SYSTEM.

A septic tank sewage system at the Western Hospital for the Insane at Watertown, Ill., consists of two oblong tanks of 70,000 gallons capacity each, placed side by side, one tank emptying into the other through a pipe. For all practical purposes however, one tank with a weir box at one end is exactly as good as two tanks, as it has been found that the water as it emerges from the first tank is just as pure as after it has passed through the second tank. The object of this weir box is to check the

ing the tank a scum will have formed on surface, 1 in. or more in thickness.

A system of this kind will not freeze in winter, as the gases arising from the sewage in the tank generate enough heat to counteract the cold and prevent freezing. The water as it emerges will be found much warmer than the air in cold weather.

In cases where the sewage discharge is scanty and intermittent there might be danger of the water freezing in the filter box during a long cold spell, and then it would be advisable to erect a small tight building, well protected from frost, over the whole outfit, including both tank and filter, but when the sewer

ed up to the required height, fermentation takes place, and intestinal bacteria are born in millions. The purifying process then commences, which consists simply of one microbe devouring another and as long as the light and air are excluded the process continues, until practically nothing solid remains. Before the effluent reaches the filter beds it must pass through two beds of rough stone, which remove all solids that are not disposed of in the purifying process. From these beds the effluent is discharged into the filtration bed, being scattered by means of six hundred sprayers. It works down through five feet of slag and runs out through the pipe into the culverts, which surround the beds, and passes into the bay over 90 per cent. pure and much purer than the bay water itself at that point.

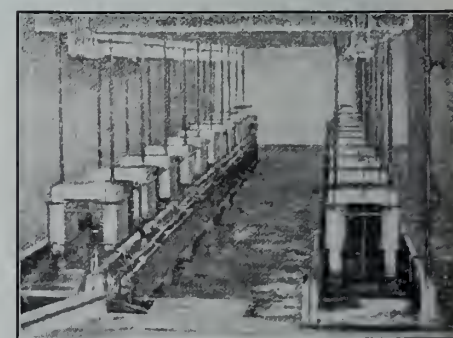
The tanks are of reinforced concrete and look as if they would last for all time to come. They are 219 feet long and 11 feet deep, the foundation being 8 feet wide at the base and 2 feet deep.

The filtration beds alone cost \$50,000. They cover three acres, contain over 17,000 cubic yards of slag, five feet deep and have over 600 sprayers to scatter the effluent. In some systems coke is used for the filtration beds, while in others the natural process of filtration through sand is preferred. It is believed, however, that the slag will prove as good, if not better, than the sand.

To guard against accident, there is a thousand feet of overflow sewer, which will permit of the sewer being pumped direct into the bay at any time in case of a breakdown. The chief feature of this system of treating sewage is the fact that it is so economically operated, the Hamilton plant requiring only two men to operate.

ELECTROLYTIC SEPTIC TANK.

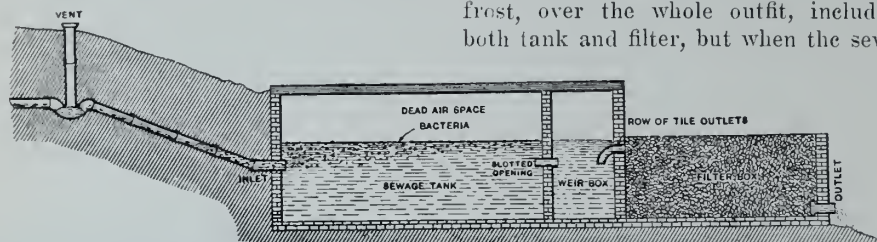
The new electrolytic septic tank just installed at Santa Monica, Cal. to kill the germs of animal and vegetable life



Costs 50 Cents a Day to Operate.

in sewerage is claimed to be entirely successful and only costs 50 cents per day to operate.

The tank consists of a pair of concrete chambers arranged parallel to



Septic Tank and Filter Box.

overflow and prevent any agitation of the sewage in the tank.

The sewage tank, as shown in the illustration, consists of a brick box with 8-in. walls and floor, lined within and without with cement. Concrete would make a better tank. The roof is made air-tight with a heavy coating of pitch, and all crevices are tightly sealed with the same material. The sewer inlet is about 2 ft. below the surface of the sewage in the tank. A short distance from the opposite end of the tank a cross wall is built, having a narrow opening extending across the tank on a level with the inlet. This opening has little if any greater capacity than the inlet. Such an opening causes less current in discharging than would a circular opening.

In the end wall is a row of curved tile so placed that the outlets are 2 ft. above the sewer inlet and the opening in the cross wall. The cross wall forms a weir, or dam, which retards the outflow from the main tank, and of course there can be no discharge until the contents of the tank and weir box reach the level of the curved tile outlets. Thus both inlet and outlet are submerged about 2 ft. below the surface of the sewage in the tank.

The filter box is filled with sand and gravel, and has an outlet at the bottom through which the water finally discharges.

The operation of this system is exceedingly simple. The sewage entering the tank remains until it fills the tank and the weir box to a level with the overflow from the curved tile outlets. In 24 hours or a little over, after enter-

ing in constant use this would be unnecessary.

The secret, if secret it may be called, of the whole system is the dark air-tight tank, the submerged inlet and submerged outlet, and that is all there is to it. The bacteria will do their work if let alone. If stirred up they refuse to perform as desired.

The tank should be large enough to hold all the sewage that is ever likely to run into it within a period of 24 to 36 hours. For a private residence this would rarely need to be larger than 3 ft. wide, 6 ft. deep and 8 to 10 ft. long.

According to the Metal Worker, New York, the system used is understood to have been of accidental discovery.

HAMILTON'S NEW SEWAGE WORKS.

The new septic tanks and filtration beds for taking care of sewage of the City of Hamilton are practically completed, but the pumps have yet to be installed. The cost of the works will total \$150,000, and they will be ready for use about March next. In some respects the system differs from any others installed, City Engineer Barrow having introduced some original ideas in building the plant.

In most of the septic tank systems in the country the tanks are covered over, because, to bring about fermentation, it is necessary to have the tanks airtight. It has been found, however, that the thick scum, which forms on the surface of the sewage, is as airtight as any roof could be, and that the bacteria work just as well under this as with a closed roof. When the tanks have fill-

each other. In these chambers are two sets of electrodes of 10 units each, charged with a strong current at a low voltage. The sewerage enters at the upper end of the chambers and in passing between the electrodes all traces of animal and vegetable life are destroyed. The sewerage issues from the lower end almost clear, in which condition it is emptied into the ocean 200 feet from shore.

The entire system, except the large receiving tank, is contained in a reinforced concrete room built below the level of the street. The sewerage is first received in a large tank, from which it is pumped to the purification chambers in such quantities as can be handled.

MYSELF AND ME.

I'm the best pal that I ever had,
I like to be with me;
I like to sit and tell myself
Things confidentially.

I often sit and ask me
If I shouldn't or I should,
And I find that my advice to me
Is always pretty good.

I talk with me and walk with me
And show me right and wrong,
I never knew how well myself
And me could get along.

I never try to cheat me,
I'm as truthful as can be,
No matter what may come or go,
I'm on the square with me.

You'll try to dodge the masses,
And you'll find a crowd's a joke
If you can only treat yourself as well
As you treat other folk.

I've made a study of myself,
Compared with me the lot,
And I've finally concluded
I'm the best friend I've got.

Just get together with yourself
And trust yourself with you,
And you'll be surprised how well your-
self
Will like you if you do.

An interesting case is pending decision, between Currie & Livock, Ottawa, and their plumbers. The trouble arose by it being discovered, that a steamfitter had been engaged who, it was thought, had not served his full four years' apprenticeship. A complaint was lodged but the employes refrained from striking. It was decided to appoint a committee to look into the matter.

Warming and Ventilating Buildings

W. H. Casmey, in Building Management.

The end and aim in applying a ventilating plant to any building is to make it breathe in unison with the number of people who occupy it. A building without ventilation is like a statue of a man, lifeless. Many of you have, no doubt, been struck with the beautiful mechanism of the human body so far as it relates to the air supply and the distribution of heat so that all parts are maintained at one constant temperature.

First, the air either enters by the warm chamber of the mouth or by the nose, the inside of which has a convoluted appearance and may be compared to a hot water radiator. It is then passed along the warm air passages to the warming chamber which contains about 15 times as much air as we are able to take in at one inspiration, and even the deepest expiration cannot empty this chamber, as it is kept firm by hard rings of gristle. Another safeguard against cooling the blood is the speed at which it travels as it is only momentarily exposed to air.

Under normal conditions the whole of the blood in the body is brought into contact with the air about once per minute, and the air we expire may very well be considered as the smoke from a furnace chimney, as the laws of combustion apply in both cases.

The parallel goes still further. The thermostat of the body is fixed at 98 degrees, and no matter, when in health, if surrounded by air at 20 degrees or 200 degrees, the temperature of the blood never varies. In the former case, deeper breathing is carried on which supplies more air to the body, and, therefore, more heat is generated, and in the later case, the heat escapes through the sweat glands in the form of moisture.

The human body is then supplied with pure air, the oxygen of which uniting with the carbon or waste tissues generates heat, and the air leaving the lungs must therefore contain the products of combustion, carbonic acid gas and also tiny particles of effete matter, which in still air very soon decompose and give off a disagreeable smell, and the air so charged is more dangerous to breathe than sewer gas.

The need of ventilation will be better understood when we consider that in 24 hours an adult, in health, gives off through the lungs 11 ounces of carbon nearly the same weight of watery vapor and the heat contained in the ex-

pired air (and given off from the surface of the body), is sufficient to increase the temperature of 5,000 cubic feet of air 25 degrees, and further we lose from the skin in the same period of time over 1 per cent. of our total weight.

We all know the composition of pure air and that under normal conditions we pass through our lungs 15 cubic feet per hour, and the figures just given indicate the change which takes place during its passage through the system. If we are to keep the conditions of a room healthy, occupied by say 20 people, we must furnish ventilation in the proportion of 3,000 cubic feet per head, or a total of 60,000 cubic feet, a little over two tons per hour, of course assuming the outer air does not contain more than one part of carbon dioxide per 2,500 of air. If this is exceeded, the ventilation would require increasing accordingly.

It has been estimated by various authorities that through fitting up a factory with a scientific system of heating and ventilating, the turnover has increased over 5 per cent. per annum. The steam engineer never attempts to pass the products of combustion over his fires again, knowing the results would be disastrous, but the same man does not hesitate to breathe over and over again his own breath and that of others, and is surprised if the danger is pointed out to him.

The disease that is at present claiming the greatest attention in its air-borne aspect is tuberculosis. Not only in the acts of coughing and sneezing, but also in the act of loud speaking, fine droplets of mucus are sprayed from the mouth into the air. They float in the air, and may be dafted by the air currents, such as obtain in ordinary rooms, to a distance that appears at first sight to be almost incredible. Thus it has been shown that by reading aloud for half an hour, bacillus prodigious may be disseminated from the mouth to a distance of 24 feet in front, and may also be obtained from the air behind the speaker.

A. M. Jordan has taken out a permit for the erection of a \$20,000 business block to be erected at Vancouver.

A building permit for the new Children's Memorial Hospital, at Montreal, was issued lately, the estimated value being \$45,000. Another big permit was for an Irish Roman Catholic church, at a cost of \$36,000.

Faulty Chimneys and Drafts

C. E. Oldacre Outlines How Some of the Faults Can Be Remedied—Bad Construction of Chimneys the Bane of the Heating Contractor—Continued From Last Issue.

Quite frequently instances are found where laundry stoves, heaters for domestic water supply, and gas hot water heaters have connections into the smoke pipe leading from the furnace or boiler, or are connected with the same chimney with the result that the draft of the boiler or furnace is greatly impaired. Such heaters are quite often out of operation and it is during such times that the draft is most seriously affected as cold air is brought into the smoke pipe of the boiler or furnace, or into the chimney itself, and this reduces the temperature of the gases passing upward through the chimney. This causes

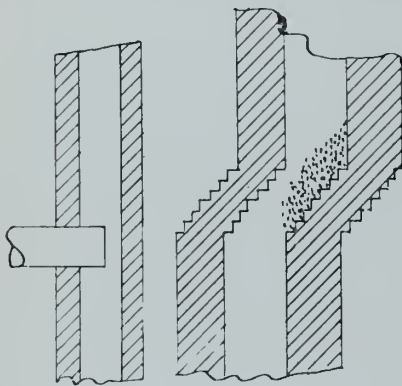


Fig. 1. Fig. 2

a reduction of the draft more or less in proportion to size of the opening into the smoke pipe or chimney. Usually the pipes leading from these heaters are provided with a damper, but as they are not tight fitting and are liable to be left open when not in use, they are not to be depended on to close off the opening.

The easiest and best way to avoid such troubles is to provide a separate chimney or flue for each separate heater or apparatus requiring a flue pipe or vent.

Capacity of Chimney.

The fact that a lighted newspaper or other light material will burn readily at the base of a chimney or at any opening into the chimney is no positive evidence that the chimney will prove satisfactory when it has a heater, range or stove attached to it. It may show that the chimney is of sufficient capacity for a small wood burning stove, but prove most disappointing when used for a boiler or furnace using either

hard or soft coal, especially if the grate is of considerable area.

The intensity of draft—that is, the velocity with which the gases are passing through the chimney, may be ample or all that could be expected, and still the fire may not produce the desired results as the chimney is not of sufficient area to allow the required volume of gas to pass through in order to produce perfect combustion.

If the gases liberated or formed in the process of combustion are not carried off with sufficient rapidity then perfect combustion can not take place.

All smoke pipes leading from any range, stove, boiler, furnace, or other heating or cooking apparatus should be as short and direct as possible in its connection between the heating or cooking apparatus and chimney as possible. All unnecessary bends, turns, and changes of direction or size or shape should be made with the idea of avoiding friction or pockets where soot can lodge. The shorter and more direct the connection, all other things being equal, the better will be the results.

Pitch Smoke Pipes Upward.

All smoke pipes should be pitched upward toward the chimney, and in no

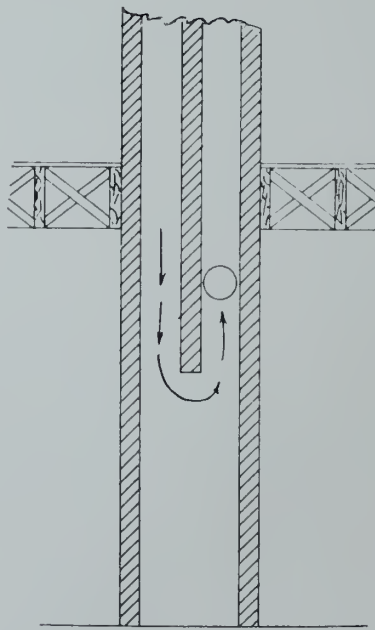


Fig. 3

case should they be pitched downward, as this affords one of the best means for the lodgment of soot and the consequent stoppage of the pipe, so that a

reduction in draft takes place. This would make no material difference if sufficient clean-out doors were provided and they were properly looked after, but this is hardly feasible in the case of domestic heating or cooking apparatus with which this article deals.

Notwithstanding what has been said concerning the intensity and volume of draft, it is possible to admit too much air under the grates under certain conditions of firing, whether the fuel is wood, hard coal or soft coal. This is particularly noticeable in the starting of a fire with light tinder, which causes smoke to be thrown out into the room or space where the range, heater or furnace is placed.

Too Much Draft.

Frequently too much air is admitted with light or low firing, causing an unnecessary waste of fuel and unsatisfactory results. The reason for this is that more air is admitted than is necessary for proper combustion and every particle of air admitted more than is necessary to produce the proper combustion, produces a cooling effect in the combustion chamber and throughout all the interior surfaces of the

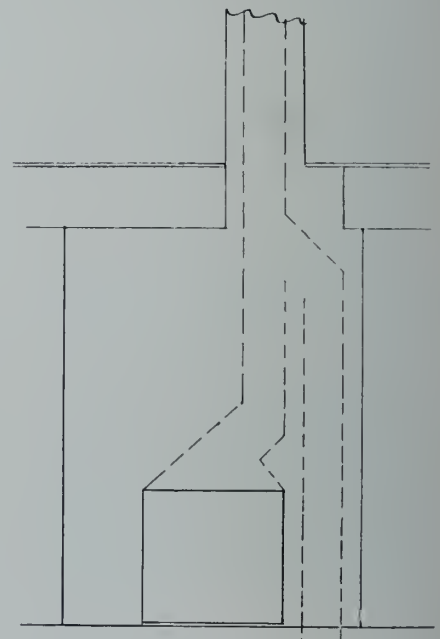


Fig. 4

stove, heater or boiler. Any operation of the drafts that produces a cooling effect or introduces unnecessary cool air over the fire, no matter how admitted,

is bound to interfere with the best results.

Any overplus of air admitted, either below or above the fuel, other than that necessary to properly support perfect combustion, is sure not only to be wasteful of fuel, but also to interfere with the very best results.

A Practical Example.

As illustrative of this fact, a range using wood as the fuel, was once called to the writer's attention which apparently could not be made to produce

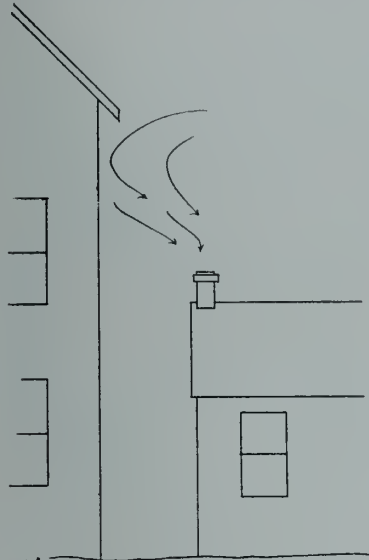


FIG 5.

good results. The oven would not bake or roast properly. On examination, all the connections, as well as the range itself were found in satisfactory condition and there was no apparent reason for failure.

The wood used was hardwood, and it was cut in lengths of 12 to 15 inches. The draft was good and the fire burned well yet the oven could not be raised to a satisfactory temperature for either baking or roasting.

On lifting one of the lids over the fire it was seen that the fuel did not cover the grates and that there was air passing through the grates around the fire, thus allowing comparatively cool air to pass over and around the oven. The entire grate surface was then covered with the fuel and the drafts were partly closed and it was only a very short time till the oven was a temperature that was all that could be desired. A practical test of the work of the oven was then made and the results were all that could be expected, conclusively showing that the troubles were all due to management through allowing air to pass through the fire box, over and above the amount required to support proper combustion.

Beyond this the fire was in more perfect control, and it was possible to carry the fire over a greater period,

thus affecting a considerable saving in fuel.

Too Light Firing.

Where continuous results are desired as in the case of hot water, steam or hot air heating apparatus, often the mistake is made of too light or too low firing—that is, not carrying a sufficiently deep fire, so that entirely too large amount of fuel is unnecessarily consumed with unsatisfactory results and requiring undue attention to the drafts. In such cases a heavier charge of fuel, meaning a large mass of incandescent or semi-incandescent coals, with practically closed drafts or nearly so, ac-



FIG 6

cording to the condition of the weather, would produce much better results, to say nothing of the less labor and attention that would be required in the operation of the heater or furnace.

Some of the causes that lead to the interference of the draft are comparatively simple and easy of solution, while others are most perplexing in the effort to detect.

Cause of Imperfect Draft.

One of the simplest causes of a bad or imperfect draft is shown in Fig. 1. Here we have a case where the smoke pipe entering the chimney is shoved through into the flue so far that the actual effective area of the chimney is greatly reduced. Such cases may be caused by carelessness in the first place or unintentional displacement of the pipe.

If the pipe is rather loose fitting a stop piece riveted to the pipe will prevent any such trouble. The opening should be no larger than the pipe itself and should be provided with a thimble of iron or terra-cotta that will not admit air around the pipe. This thimble should be well mortared into the chimney so there are no openings around it. The ordinary tin collar (usually lacquered) may present a neat and ornamental appearance, but it is

not to be depended upon to produce a tight fitting joint.

Fig. 2 shows a chimney that is offset in its course. This offset may be located at any point between the opening for the smoke pipe and the top of the chimney and it affords a suitable place for the lodgment of dirt, loose bricks, mortar or soot, causing a consequent lessening of the area of the chimney and thus a reduced capacity for carrying off the products of combustion. Too frequently, when such offsets occur, due to the design or nature of the building construction, the work is not done with the care it should receive, and the area is often restricted or the surfaces are left extremely rough. It is also harmful to the draft if the area at such points of change in direction is unduly increased. The area should be maintained throughout and the flue should be as smooth as possible. Wherever such offsets occur, if quite sharp, there should be provided a tight fitting cast iron clean-out door that is readily accessible.

Two Flues in One Stack.

Fig. 3 shows the case of two flues in the one stack or chimney breast with a portion of the dividing wall, or withe, left out below the point of entrance of the smoke pipe. For the purpose of illustration let it be supposed that the flue shown without an inlet for a smoke pipe is not in use, then this flue acts as a check on the other flue, admitting cold or cool air into the used flue so that the draft is checked to a very

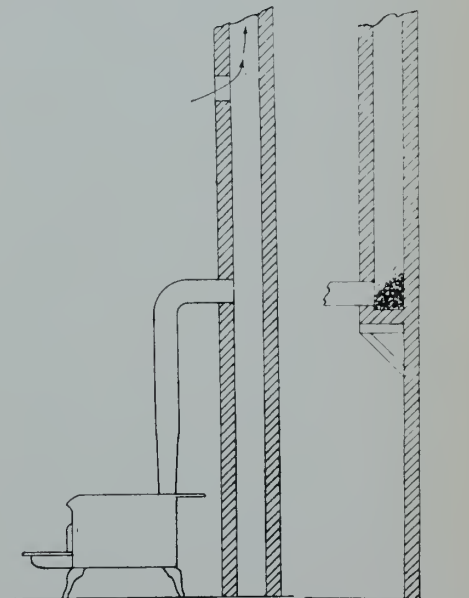


FIG 7

FIG 8

appreciable extent. Such flues can never give satisfaction and the only cure in such a case is to wall up the dividing wall or withe separating the two flues so that there is no communication between them. Where such cases are met with the blocking of the offending

opening will quickly show the difference in results, if this is the only trouble to be found with chimney in question. An improvement is sure to be found, but if it does not wholly rectify all the trouble then of course one must look further for other interferences with the draft which may occur.

Fig. 4 shows a very common cause of trouble—two flues leading into one common flue. The cut shows a flue passing a fireplace which is open, and then entering into the same flue as that in connection with the open fireplace. The cool air passing through the fireplace provides a continuous check on flue that is in use. There is practically only one cure for such a case and that is the abandonment of either one or the other flue and the complete closing of the flue that will not be used. It is practically impossible to have the two flues operate successfully through the one common chimney under any condition.

Low Chimneys.

Fig. 5 shows a chimney which is situated between two higher buildings. Such chimneys are very likely to be termed "cranky" and are affected by changes of direction of the wind. At certain times they may operate with reasonable satisfaction and other times be the source of considerable annoyance and dissatisfaction.

Fig. 6 shows a very similar case, except that the interference comes from only one direction—that of the higher building on the windward side, due to the direction of the wind and the slant of the roof, together with the position of the chimney, reversal of the draft may be frequently noticed. In either of these cases the use of a revolving cowl that will prevent the wind pressure from directly acting on the top of the flue will be found a ready remedy, or it may be necessary to extend the chimney to such a height that its top is removed above the offending wind currents. Sheet iron extensions are not durable, and should not be resorted to except for temporary purposes if any other remedy is indicated as feasible.

Fig. 7 shows a very common cause of complaint and is very closely allied to the causes of trouble shown in Figs. 3 and 4—the admission of cold air into the chimney through openings into the chimney other than the inlet for the smoke pipe for the stove or heater for which the chimney is intended. Such openings should be tightly closed with brick and mortar and well plastered. It is the only safe thing to do.

Fig. 8 shows a chimney with the smoke pipe entering at its very base, and not provided with a clean out at a lower point. In such case the entrance

point of the smoke pipe is likely to become clogged with soot, mortar, sand or other material, causing a lessening of the draft. Such a chimney will require frequent attention—the amount of such attention depending on the kind

of fuel. When soft coal is used the attention required will be more frequent than with hard or anthracite coal.

In a following article other conditions affecting the draft of chimneys will be illustrated and explained in detail.

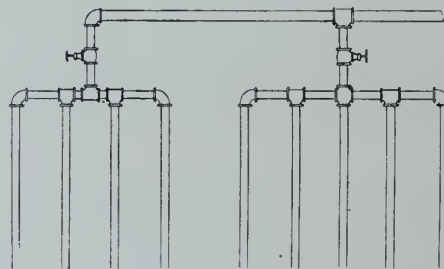
With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

CHANGEABLE WEATHER HEATING ECONOMY.

When heating is done by live steam a good deal of coal is wasted during the transitory months of the year when warm and cold weather alternate. When a hot day comes suddenly, all the windows are opened and the boiler in the power house helps heat outdoors. A scheme has been put into effect at the new plant of the Grand Rapids Hand Screw Company, whereby the addition of a valve, a couple of elbows and a short piece of pipe, steam can be turned into four, five or nine lengths of piping according to the weather. As shown in the sketch, each bank of pipes is divided into two sections—consisting of four and five pipes respectively.

When the weather is very cold both sets of pipes can be operated. In milder temperatures steam can be turned into four or five pipes. Three different degrees of heat can therefore be obtained by the addition of two valves and a little extra piping. The first cost is insignificant



Arrangement of Pipes and Valves.

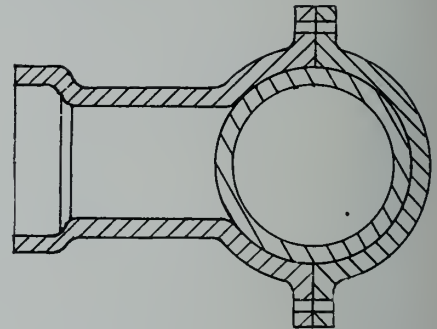
compared with the coal-saving possible in changeable weather. The piping in the plant is hung on the walls near the floor and the valves are located conveniently near doorways.

MAKING A PIPE CONNECTION.

Making a connection to a water pipe without lowering the pressure is rather an interesting operation. In making the connection of an eight-inch pipe at Lindsay, Ont., this was done successfully by J. Howard Bridge, without depriving the town of their water supply. The work is usually done by closing down a pumping plant for a couple of hours, but this was accomplished in this case

while the water in the pipes remained at its usual pressure.

A special casting, shown in section in the illustration is clamped over the place



Section of Special Casting Fitted Over Pipe.

where the connection is to be made. An extension with a gate valve is leaded securely and in front of this is bolted a plate. Through the centre of this plate is a hole through which extends a cutter shaped like a carpenter's extension bit. The centre part is in the form of a screw and screws into the iron pipe while the extension bit cuts a piece out of the pipe. This cutter is worked by a ratchet wrench. When the piece of pipe is cut it is drawn out close to the plate. The screw enables the operator to do this. The piece cut out is slightly less than the valve, so it draws through the valve easily.

During the operation the gate valve is open. After drawing the cut piece of the pipe to the plate the valve is closed. The plate is unbolted and the piece of pipe is removed. This is not a new idea of Mr. Bridge's but was used by him at Lindsay.

DISPOSAL OF HEATING SYSTEM RETURNS.

In installing a heating system in a large factory recently I came across the following proposition the solution of which may interest some of your readers in charge of plants operated on similar lines.

In the installation to which I refer the heating of the factory was by means of blast coils, through which the cold air was drawn by a fan and distributed throughout the various air ducts. Ex-

haust steam was used for heating the coils, and a back pressure of five pounds was carried on the engine. The returns from the blast coils were led into a low pressure steam trap and from thence discharged into an open feed water heater of the "no thoroughfare" vacuum type.

When the system was laid out, evidently no thought had been taken of the fact that the same pressure existed in the feed-water heater as was present behind the low pressure steam trap. In consequence when the plant was started up, the steam trap failed to discharge the returns from the heating system into the feed-water heater, owing to there being an equalization of pressure. Fortunately the feed-water heater was of the "no thoroughfare" type, i.e., there was only a branch connection taken to it from the main exhaust pipe, of suf-

set to reduce the pressure of five pounds carried on the exhaust main down to two pounds in the heater, thus enabling the steam trap to discharge the returns from the heating system against the lower pressure carried on the feed-water heater.

The operation of the reducing valve under such conditions was more or less an experiment, but the makers assured me that it would do the work. Under a prolonged test and up to the present time, which is three weeks since the change was made, the arrangement outlined above has worked perfectly. The variation of pressure in the feed-water

that letter conveys, it seems to me that a vast amount of preparatory work will have to be done before any of the objects mentioned can be considered even in a formal way. The average, yes, the majority of plumbers are practical men, not business men, and they will figure for twenty years and never learn anything by the process.

I have yet to see that much abused subject "Competition" discussed in anything like a scientific way. It is made the scape-goat for all the ignorance, inefficiency, and general cussedness of the plumbing fraternity, and, after all, it is more often than not a bogey-man of their own imagination.

Suppose we had all that friend George suggests in the way of plumbing by-laws, inspectors that inspect, regulations that regulate, and other trifles of a similar nature, together with a nice large club studded with rusty nails for the supplyman who failed to send out perfect goods, how much better off would the average firm be? Not a particle. In fact, it would only be an additional burden to them.

Why we will persist in looking any where else than within for all the trouble is beyond my understanding. Personally, I think the trade is getting just what it earns, its standing socially is what it deserves and it will so remain till the individual is educated and knows the sole cause of all is himself.

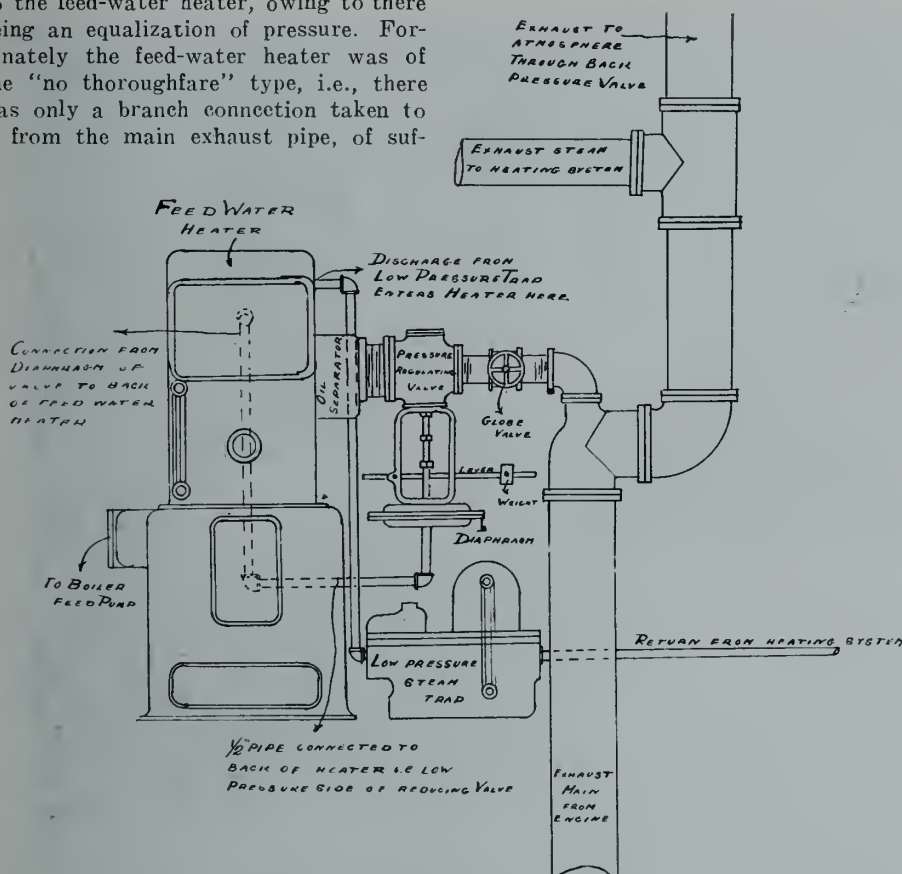
In the meantime, I feel curious as to what those two or three questions are that friend George proposes sending out, and will end by suggesting the first essential of a permanent organization, viz., that the membership be limited to one half the trade in any city.

ERNEST H. RUSSELL.

London, Nov. 10, 1908.

SPOKANE AFTER CONVENTION.

Spokane, Wash., will be the scene of the next convention of the National Association of the Master Plumbers of the United States in the summer of 1909, if the endorsement by the State and local branches of that organization in the Pacific northwest and of a large number of national delegates in this part of the country and the middle western and eastern States and several executive officers carries any weight. Members of the national association in Washington, Idaho, Oregon and Montana believe that Spokane's invitation will be accepted, for the reason that its position, already excellent, will be greatly strengthened by the granting of special rates, one fare or better for the round trip, from practically all railroad points on the continent, to the Alaska-Yukon-Pacific Exposition at Seattle, with stop-over privileges at Spokane,



Disposal of Heating System Return.

ficient size to supply the exhaust steam necessary to raise the feed water to 210 degrees F. With another type of heater the following arrangement could not have been adopted, which was found to be perfectly successful.

The exhaust inlet to the heater was 4 inches. I procured a 2"x4" pressure regulating valve of the diaphragm type. This valve is constructed with an independent diaphragm of large area, is extremely sensitive and will respond to the slightest fluctuation of pressure. The low pressure connection to govern the operation of the valve is taken as far away as possible from the valve; that was in this case from the back of the condensing chamber of the feed water heater, as shown on sketch.

The pressure regulating valve was

heater was not more than half a pound at the most, and this was due to the condensation of the exhaust steam, in the feed-water heater tending to form a vacuum. The temperature of the boiler feed water leaving the heater averaged about 205 degrees F, the minimum being 200 degrees F.

The accompanying sketch shows the method of connecting up the pressure regulating valve as outlined above.

PLUMBERS THEMSELVES TO BLAME.

Editor Plumber and Steamfitter,—I notice Mr. George Cooper's letter in The Plumber and Steamfitter of Nov. 2 as to organizing a provincial association, and while I heartily endorse all

ROBERTSON'S HANDSOME DISPLAY ROOMS.

One of the neatest and most attractive display rooms for sanitary appliances in Canada is that recently opened by the James Robertson Co 265 King Street West, Toronto. What was formerly part of the old saw works has been transformed by them into an admirable and spacious apartment for exhibition purposes. Here the trade and customers of master plumbers who want to make a personal selection of high-class baths, lavatories, closets, etc., can witness a magnificent and most complete exhibit of all that contributes to the comfort and

end of the room, while the south side wall is fitted above the burlap with chip glass. The effect is decidedly pleasing.

In bath tubs, shower baths, water closets, lavatories, kitchen sinks and bath room appliances, the exhibit is a most representative one, and arouses much interest. All kinds of tubs in porcelain or enameled iron, with all the latest fuller and compression attachments, china handles, etc., are shown, suitable for the mansion or the modest cottage. Included in the display are foot, sitz and child's baths. One particularly noticeable shower bath is a nickel-plated shower with needle and

cluding brass frame, white enamel and combination. The bath room mirrors are most artistic, and lend a decided charm to the display room. There are also toilet tables, bath room cabinets and bath room fixtures, including towel bars, both glass and nickel, and nickel-plated tumbler holders. In all these lines the James Robertson Co. carry an extensive assortment.

To the west end of the display room is a line of closets composing the Naturo, Kingsquare, Aeme and Fleur De Lis, all fitted with flushometer and the latest designs of tanks. A special closet is a



James Robertson Co.'s Magnificent Sample Rooms at Toronto—Looking West.

convenience of the home in the sanitary line.

The room is 60 feet long by 20 wide. It is splendidly lighted by a number of large plate glass windows and in the evening is brilliantly illuminated with electricity, the impression being particularly striking on passers-by in the King Street and Belt Line street cars. At the entrance is a vestibule with marble floor, in which the monogram of the firm appears. The partitions are of oak fitted with bevel plate glass. The floor of the display room is of hardwood and the walls are covered with burlap, surmounted by plate glass mirrors at either

end of the room, while the south side wall is fitted above the burlap with chip glass. The effect is decidedly pleasing.

Along one wall are Kingdon china lavatories, both pedestal and wall fixtures, and the latest styles of enameled iron, fitted with different kinds of basin cocks, patent wastes, nickel-plated traps and supply pipes. There are also exhibited several marble lavatories, including one with marble aprons, shelf and marble pillars to support shelf, and plate glass mirror, with brass frame, equipped with cast brass legs and fuller faucets with china handles.

Adorning the wall are all styles of mirrors in many attractive shapes, in-

cluding brass frame, white enamel and combination. The bath room mirrors are most artistic, and lend a decided charm to the display room.

The range of sinks is extensive and comprises porcelain Kingdon china and cast iron enamel in many different styles, including vegetable sinks.

The show room is certainly inviting, and cannot fail to be of interest and instruction to the trade. It is spacious and most effective from every standpoint. The company still retain as a practical display room the one formerly used before the present convenient one, and it is intended that it be fitted up with sample fixtures of all kinds in operation.

Use of Slip Joints in Plumbing Systems

Address by H. W. McVea, Omaha, Before the American Society of Plumbing and Sanitary Inspectors.

In this day of modern plumbing, with its open fixtures and the use of iron and brass pipes in supplies, wastes and vents have brought into universal use the slip joint, as a means of connecting. The question of the use of the slip joint has got to be a great means of rapidity for use in the construction of plumbing; this connection, in my opinion, has a great many more opportunities for de-

is made on completion of the work, and even if this test is applied and joints prove tight at the time, we have the same condition of the packing deteriorating and eventually leakage, which will only be discovered by sickness and odors.

Making the Connections.

I wish to call your attention to the different methods in making these con-

nections roughing in measurements to vary, thereby allowing one part of the connection to be on an angle and the other part straight, and not allowing the joint to properly free itself, which will allow one side to tighten up and either cut or tear gasket in two. By constant screwing up union would simply put this gasket into a ball and be of no use whatsoever.

The slip joint connection does not leave any piece of work secure, and any obstacle which might be used by any person in cleaning about or in any way come in contact with these connections to move or jar them, they become defective and leak.



James Robertson Co.'s Magnificent Sample Rooms at Toronto—Looking East.

fectiveness, more so than any other part of the system, the writer having in mind a case of a slip joint on a lavatory supply in a residence, where the packing blew out while the family were out and caused a damage of \$1,000. I have also seen them blow off the connections, because the plumber was careless and cut the supply pipe a little short and the pipe under the floor was not firmly secured, allowing it to pull part. While we do not have this danger in the use of slip joints on vent connections, we have a greater one to health from escaping gases. If the connections are made carelessly, in cases where no smoke test

nections. You will notice that in making a connection of a brass trap to a wrought iron pipe, the end of the wrought iron pipe will have burrs or rough surface, so that when the joint begins to make tight, that the packing or other substance, which is used, becomes torn to shreds. This substance is nothing but a powdered form and simply passes away by suction or the decaying by dampness or sewer gases, owing to the fact that the traps, which are supposed to be $1\frac{1}{4}$ inches or any other size, will leave a space after being inserted into the same size wrought iron pipe. Another reason is that the slip joint al-

I have still to learn of the first slip joint, which has been in any length of time, that does not leak.

In my judgment their use should be eliminated as far as possible both in supply and vent connections. In the case of supply connections, especially, with high pressure, there is a constant danger of them blowing out the packing or leaking at some time, as the material used in packing will deteriorate. There is nothing to recommend their use except the saving in labor, and while quite a convenience, eternal vigilance, added to the first cost, undoubtedly is the price of a slip joint.

NEWS OF THE TRADE IN CANADA

A new heating system will be installed in the Queen's Hotel, Hespeler, Ont.

The Pease Heating Company, Toronto, has decreased its capital stock from \$40,000 to \$20,000.

Stevenson & Malcolm, Guelph, report having completed a \$1,500 steam-heating job in the City Hotel.

A new heating and plumbing firm has been started in Sydney, N.S., known as Farmer & Lewis.

W. J. Smith, of the Western Plumbing and Heating Co., Saskatoon, has recovered from an attack of fever.

Park Bros., of Chatham, Ont., have completed the installation of a new filter at the Chatham city waterworks in the Occidental Hotel, Rosthern, Sask.

Tenders are being called for the plumbing of the market building, Winnipeg.

Lockhart & Co., Galt, have secured a contract in Hespeler, which will keep their staff of men occupied for about six weeks.

G. G. Taylor, Saskatoon, Sask., has the contract for installing the plumbing fixtures in the police office and firehall in that town.

Clark & Adams have been awarded the civic contract of constructing a boiler house and for heating two warehouses in St. John, N.B.

The Gartshore-Thomson Company, Hamilton, has secured the contract for the pipes and castings for Hespeler's new water system.

The contract for the heating and ventilating of the new Lord Selkirk School, Winnipeg, was awarded to Thomson & Hosmer, for \$11,355.

A. W. Humphries & Son, Parkhill, have installed plumbing and steam-heating systems in the new residence of Oliver Baird, Parkhill.

C. S. Jackson, Bridgeburg, has secured the contract for the plumbing and gas-fitting in the new factory of the Buffalo Specialty Company at that place.

The contract for the plumbing and steamfitting of the new Graham & Horne Building, Fort William, was awarded to the Fort William Hardware Co.

Fred. Smith, Guelph, has just completed a \$1,500 vacuum steam-heating job in the Neustead Chair Company's factory, using the exhaust steam from the power plant.

Robert M. Yeomans will be an aldermanic candidate in Ward Two, Toronto, at the coming municipal elections. Mr. Yeomans is a master plumber, and has taken an active interest in literary and debating societies.

John M. Owston, sales manager of the James Robertson Company, Toronto, is hunting with a party near Haliburton. He's after moose—not booze. John's party strictly taboo liquid ammunition in their camp supplies.

Clark & Adams, St. John, N.B., have been awarded the contract by the city for building a boiler house and installing a heating apparatus in the new warehouses on the western side of the harbor. The cost is \$1,525.

Tenders are in for the heating of the addition to the Guelph Armories. The original job of hot water heating was completed last spring. The contract was about \$4,000, and another \$2,000 worth of work is now to be done.

Recently 200 services were shut off in Galt where no water rate had been paid by consumers. To have the water turned on again it was necessary for the delinquent to pay the full arrears, without any discount and fifty cents extra.

A. D. MacArthur, of the Standard Ideal Sanitary Co., Colborne St., Toronto, has returned from an extended Western Ontario trip. He visited many centres and personally distributed to the trade the company's splendid new catalogues of porcelain enamelware.

The master plumbers of Fort William are now contemplating getting into line with association work. The secretary of the National Association has received a request from this city for the constitution and by-laws of the association. The good work is evidently spreading.

P. E. Macdonald and A. L. Macdonald, of the Standard Ideal Co., Port Hope have left Montreal for the purpose of personally distributing the handsome catalogue which the firm have gotten up. Mr. Macdonald, sr., will travel east as far as Prince Edward Island, while his son will go west as far as Cobourg.

W. H. Hammond, superintendent of the hardware department of the Taylor-Forbes plant at Guelph, and known to many plumbers on account of his former connection with the Dominion Radiator Company, Toronto, was taken to a hospital last Saturday. Mr. Hammond is afflicted with ossified veins and no hope is held out for his recovery.

An unusual complaint on Monday was laid at Windsor before Magistrate Bartlett, with the result that Frederick Ricker, a plumber, residing in Detroit, was ordered to immediately cease work on a job on which he was employed. It was charged that Ricker, being an American, had no right to engage in his calling in Canada, the complaint be-

ing made by the Windsor Plumbers' Association. The magistrate took the case under advisement, and meantime ordered Ricker to do no more work until the matter had been decided. This is the first time in several years in which violations of the alien labor law have come before the notice of the courts.

A good story comes from Ottawa about a couple of Bank Street plumbers who went duck shooting with a Toronto supply man a fortnight ago. A storm arose during the afternoon and drove the party onto an island. Then something went wrong with the heavenly plumbing arrangements and it soon became a case of "water, water everywhere but nary a drop to drink." The afternoon dragged into the night and the long hours of darkness on the unsheltered isle were brightened only by the reassuring "never mind, boys, don't weaken," from the enamelware jobber. Morning came at last and the party rescued themselves, vowing that they would never be caught so unprepared again.

CANADIAN TO THE FRONT.

J. C. Alford, an old Peterboro boy, has been appointed to the important position of supervising plumbing inspection.



J. C. ALFORD,

A Peterboro' Boy Who is Now Supervising Plumbing Inspection of Chicago.

tor of Chicago. He will have charge of all plumbing inspections in the city. The Plumbers' Trade Journal, New York, refers to Mr. Alford as one of the most prominent plumbers in Chicago.

**EXPERIENCED INSPECTOR
WANTED.**

The plumbing trade in Brantford is well represented, the following being among the leading firms: C. E. Taylor & Co., Alf. Taylor, J. Palmer & Co., Jas. Muirhead, T. A. Cowan, T. J. Minnes & Co. and Wm. Tipper & Son. There is quite a variety of work to be done by the trade, for Brantford has, besides sewerage and waterworks systems, natural and artificial gas and electric light. This naturally means much business and plumbers are satisfied with what is going on. The plumbing regulations and the sanitary inspection laws, however, might be much improved, though Brantford is no exception in this regard. When the general public come to recognize the importance of proper sanitary inspection they will demand that thoroughly qualified men who understand plumbing and sanitary matters by experience as well as by theory are appointed to see that the public health is safeguarded by the enactment and strict enforcement of sane, wise and safe regulations.

REASON WHY.

Whenever the penurious manager of the department store wanted to sharpen his pencil, he would enter the shipping department and borrow a knife from one of the boys. Sometimes the boys did not have their knives with them, but there was one lad, Tommy Breen, who always could be depended upon.

"How is it, Tommy," asked the manager one day as he whittled his pencil, "that you always have your knife with you, and the other boys haven't?"

Tommy hesitated for a moment, then gathering courage, said:

"The wages I get aren't enough for me to afford more than one pair of pants."

HOPPER CLOSETS PROHIBITED.

The Newcastle Water Company, Newcastle Pa., has issued orders that hopper water closets will not, under any circumstances whatever, be allowed by the company, and that under no circumstances will the company permit any person to make connections with any water main or service pipe unless they are regularly licensed plumbers and recognized as such by the authorities of Newcastle. The company also announces that all water closets used in connection with the water furnished in that city must be of the tank pattern and of an approved make. And in addition it is further announced that any person tak-

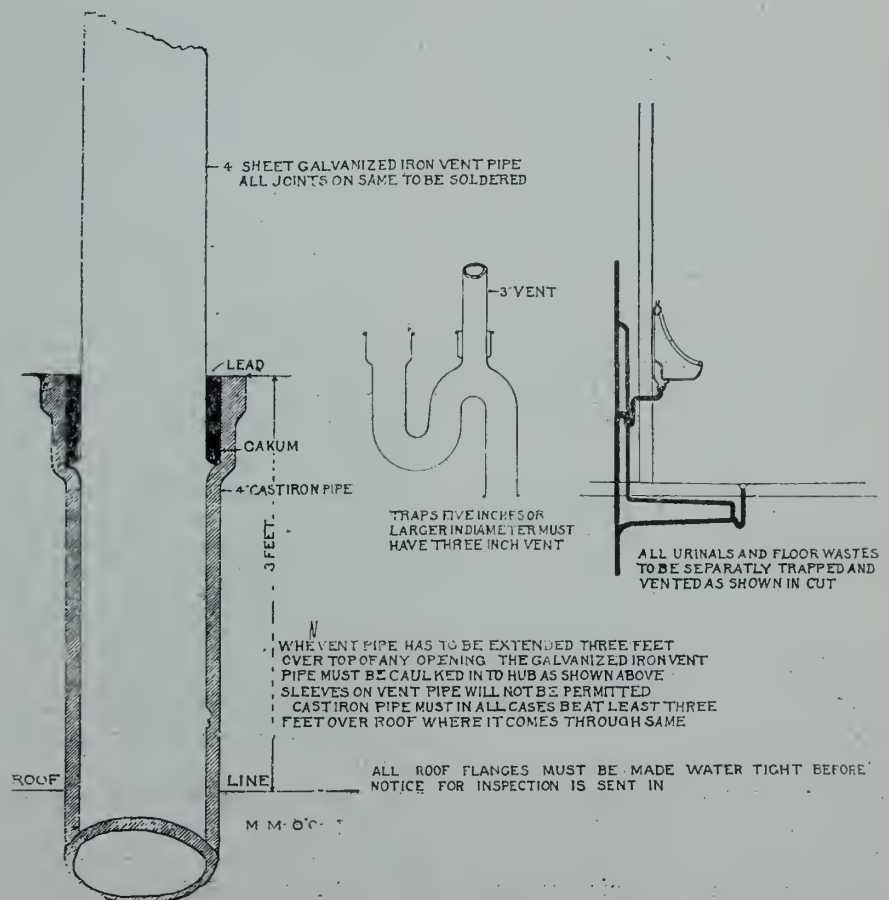
ing out or putting in any old fixtures, or making any connections with the lines or mains of the water company will be prosecuted to the full limit of the law. There has been a great deal of trouble in Newcastle and other towns in Pennsylvania during the past six months, caused directly by such practices as these, and many of the smaller towns have been considering taking steps to put an end to the practice. Many mechanics have been out of work, and when trouble has arisen in the plumbing systems in theirs and their friends homes dozens of these men have undertaken to repair them themselves, in some cases going so far as to purchase supplies and fixtures from the mail order houses, and then tear out the old and replace them with these fixtures. In the end the legitimate plumber had to be called in. Then more trouble arose, for as soon as it is seen what kind of a job had been done, the plumber refused to touch the work. Johnstown, Pa., has had considerable trouble along the same lines.

JUDGMENT FOR \$500.

"I think there must be judgment for the plaintiff for \$500, with interest thereon, as provided in the two promissory notes sued on, such interest to be computed by the clerk of the court." The above was the judgment given in the case of W. J. McGuire Co., vs. the Gold Medal Furniture Company, Toronto, by Judge Morgan on Nov. 5. The company was sued last December in the county court for payment of \$250 each, a balance due on a contract of \$6,100 for installing a heating and spraying system for the McGuire people. The defence claimed to be the victim of the plumbers' combine, alleging that the W. J. McGuire Company's tender, which it accepted after considering offers from Purdy & Mansell, the John Ritchie Heating Co., S. Ryding, the Fred Armstrong Co., Bennett & Wright, Lewis Legrow and E. Larter, was not genuine. Judge Morgan could not find evidence to support the contention.

OTTAWA PLUMBING CHART.—No. 5.

NICKLE PLATED OR BRASS PIPE MUST HAVE SCREWED JOINTS OR WIPED JOINTS BOLT OR SWEATED JOINTS WILL NOT BE PERMITTED. CONNECTIONS MUST BE MADE AS SHOWN IN CUT OR LEAD PIPE WIPED ON TO BRASS SOLDER NIPPLE AND NICKLE PLATED PIPE WIPED ON TO LEAD PIPE



Roof Flanges When Made of Galvanized Sheet Iron Must Fit Cast Iron Pipe Closely. Loose Sleeves Will Not Be Permitted.

CONTRACTS AND BUSINESS OPPORTUNITIES

Municipal Works.

Work is being rushed in the laying of the salt water high pressure mains in Victoria.

Owen Sound will vote on a by-law to expend \$100,000 on the extension of its waterworks system.

The Port Colborne waterworks system is again in operation, repairs having been made to the engine. The cost was \$5,000.

Work has been completed on the new auxiliary waterworks system at Portage la Prairie, under the direction of Willis Chipman, C.E.

A test made at the Listowel waterworks showed that the new wells supply enough water to keep the pumps going at full capacity.

Yorkton citizens tendered a banquet to J. L. White, inventor of the White system of waterworks, which was recently installed in that town.

The waterworks of North Vancouver will be extended, the recent sale of \$35,000 of city waterworks bonds enabling the work to be proceeded with.

The voting on the extension of the waterworks in New Liskeard resulted in only a small number of ratepayers casting their ballots. The majority for the by-law was 37.

About nine miles of the ditch for the gravity water pipe line are completed and the work of constructing the big pipe which is to convey the water to Calgary has been started.

The water supplied to Montrealeers last year totalled 12,439,889,245 gallons. The daily demand is increasing. In five years the consumption has gone up by 10,000,000 gallons per day.

The new Ozone filtration plant in Lindsay is almost completed. The capacity of the tank is 1,500,000 gallons. When finished the water of Lake Scugog will be drinkable. It is thought the plant will be a success.

Hamilton fire and water committee has accepted the tenders of the Canadian Westinghouse Company, Hamilton, and the John McDougall Company, of Montreal, for motors and pumps for the Beach pumping station, the combined cost being \$20,148 or \$2,028 higher than the tender of the General Electric Company, of Sweden, with the Montreal pumps.

A building permit was issued at Victoria to the Hydraulic Supply Manufacturing Company, to which was recently awarded the contract for the putting together the steel pipe for the main from the pumping station at Elk Lake to the reservoir.

An oil refinery valued at \$150,000 is to be erected at Port Moody and to be in operation by next March. The plant is to have an annual capacity of 72,000 barrels, the refined product being valued at half a million dollars. The crude oil is to be secured in California.

The Woods Product Company is doing a considerable amount of building at Donald, five miles from Haliburton, Ont., where the company has a timber limit of 23,000 acres. A plant for the manufacture of wood alcohol, corona spirits, acetate of lime, charcoal, etc., is to be erected. One hundred men will be employed.

Public Buildings.

A large brick school will be erected at Port Stanley.

Bulgarian citizens of Toronto have decided to build a church.

Moose Jaw has let the contract for a high school building costing \$93,000.

The sum of \$10,000 will be spent in decorating St. Mary's Cathedral, Hamilton.

The corner stone of the new Broadway school, in Woodstock, N.B., was laid recently.

Strassburg, a progressive town in Saskatchewan, is erecting a new town hall, for which tenders are being called.

A new high school will be erected in the east end of Vancouver and two other schools in the southwest portion of the city.

A new school for higher commercial studies is being built in Montreal, the corner stone being laid last week by Premier Gouin.

J. C. M. Keith, of Victoria, won the \$500 prize competition for plans for the new asylum building at Coquitlam. E. G. W. Sait, of New Westminster, was second, winning \$250.

Construction work on the new general hospital, College Street, Toronto, will begin immediately. The plans indicate that the structure will cost \$1,112,000 and will accommodate 400 patients. The cost of the site will be between \$600,000 and \$650,000, with a frontage of 728 feet on College St.

General Building Notes.

A \$9,000 school will be built at Golden, B.C.

John Hayman will build a rooming house at London.

Building operations are particularly active in Princeton, B.C.

Dr. F. L. M. Grasset will build a \$12,000 dwelling at Toronto.

A \$1,200 skating rink will be erected at Morden, Man., this winter.

D. E. Harris will erect a \$10,000 apartment house at Vancouver.

The Bank of Montreal is erecting a fine new building at Stirling, Ont.

Alanson Moote will erect three brick houses in Hamilton to cost \$8,400.

N. T. McMillan is building a \$7,000 residence at Fort Rouge, Winnipeg.

Geo. Birdsall, Toronto, will spend \$12,000 on the erection of new dwellings.

W. F. Petry, Toronto, will build two pair of dwellings at a cost of \$11,000.

The Bank of Montreal will erect a \$500,000 branch building at Winnipeg.

A \$17,000 store and office building will be erected at Vancouver by P. Burns & Co.

The Keltz Building Co. will erect 12 dwellings at Toronto at a cost of \$18,000.

The St. Thomas Aquines congregation will erect a new church building at Montreal.

R. A. Y. Stinchcombe, London, will erect a large store and an apartment house.

H. J. Tharle will erect a large apartment house at Fort William, to cost \$20,000.

The new Y.M.C.A. building at Woodstock, Ont., costing \$20,000, was opened recently.

The Fraternal Order of Eagles, at Nelson, B.C., will erect a hall, to cost \$20,000.

The Bell Telephone Co. will erect a \$300,000 building on Temperance St., Toronto.

Plans have been prepared for the new Collegiate Institute to be erected at Brantford.

Building permits were granted at Vancouver to G. P. Smith, \$5,500; R. W. Harris, \$3,500.

A new \$30,000 warehouse is being built in Vancouver for A. C. Flumerfelt, of Victoria.

The building permits in Vancouver for the first ten months of the year amount to nearly \$5,000,000.

The contract for the new library building at Selkirk, Man., has been awarded to Jos. Ingundmusson.

The contract for the Salvation Army citadel at Fernie, B.C., has been awarded to Digby & Walde.

In Regina a \$10,000 warehouse is in course of erection for the Hambury Construction Company.

A. S. Yarwood has just taken tenders for the construction of a public school house at Shanawan, Man.

The Pure Gold Mfg. Co. will erect a two-storey addition to the factory,

College Street, at an outlay of \$10,500.

Geo. Fischer has been awarded the contract to erect the new Evangelical church at Medicine Hat.

M. E. Case is erecting four attached stores and dwellings on Queen Street, Toronto, to cost \$10,000.

It is expected that the year's total of building permits in Victoria will reach over a million dollars.

A permit was issued at Vancouver to Thomas Ashe for the fire hall to be erected there at a cost of \$1,320.

Architect Bossons, Dauphin, is preparing plans for a new school building to be erected at Minitonas, Man.

F. W. Henbach, Winnipeg, is preparing plans for the erection at Norwood, Man., of 10 dwellings, to cost \$3,000 each.

Robt. McDonald, Edmonton, has completed plans for the erection of a large brick and stone hotel to cost \$20,000.

W. Odell has the contract for building the new \$60,000 sanitarium at Tranquille, B.C. The work will be rushed.

A theatre costing \$10,000 will be built at Port Arthur by William G. Gillman. Work is to be commenced this month.

Neely & Wilson, Dauphin, Man., have been awarded the contract to build the new Anglican church at Barrows, Sask.

The Brandon, Man., fire and light committee recommended that plans be prepared for the erection of a new fire hall.

A block of stores with a large apartment house above, to cost \$75,000, will be erected in Toronto by Geo. Phillips.

The tender of Frank Rooney, Weyburn, at \$15,150, has been accepted for the erection of the new school at Lang, Sask.

The Rideau Stove and Plow Company of Smith's Falls, will build a distributing warehouse, 40x70 feet, at Saskatoon, Sask.

Stockwell & Henderson have taken out a permit for the erection of a \$20,000 dye house and store at 78-80 King Street West, Toronto.

The Free Masons are erecting a new hall at Eglinton, the corner stone being laid recently by A. T. Freed, Grand Master of the Grand Lodge.

A permit has been issued for a Methodist Deaconess' Home, at the corner of St. Clair Avenue and Avenue Road. The cost will be \$100,000.

In Montreal last month 126 new buildings were erected, at an estimated cost of \$377,085, against 138 at a cost of \$998,150 for October last year.

Campbell, Burke & McClay, Vancouver, have the contract for building the new fire hall at Grandview, B.C., at \$6,920.

Plans for an apartment building, to

be erected at Winnipeg for G. Stirrett, at a cost of \$35,000, have been completed.

October was a decidedly busy month in building operations. The permits issued in the majority of cities exceeded those of the corresponding month last year.

The contract for the erection of the new brick school at Ninga, Man., has been awarded to E. E. Poole, Stoughton, Sask.

The North Toronto school board has accepted the plans of Architect Langley for enlarging the Davisville and Eglinton schools.

The Finnish Co-Operative Society will this fall begin the erection of a \$15,000 public hall and business block at Port Arthur.

Isaac Rose, Newmarket, has closed a contract with the Metropolitan Railway Co. to build stations at Jackson's Point and Sutton.

Building permits have been issued at Brantford to John Binnell, frame dwelling, \$1,200, and to Miles Standon, frame dwelling, \$1,200.

James Chisholm has plans nearly ready for a brick and stone four-storey apartment block to go up at Winnipeg, to cost over \$20,000.

A contract for the construction of a public building at Saskatoon, to cost \$13,300, has been let to Dion & Simon-eau, Cookshire, Que.

It has been definitely decided that the new sanitarium to be erected by the Seventh Day Adventists of Alberta, will be located in Lacombe, Alta.

W. J. Ross, warehouse, \$1,000; Louis H. Speer, two houses, \$2,000 each; A. Snelgrove, house, \$2,500, are recent permits issued at Port William.

Negotiations are said to be pending with American capitalists for the erection of a large hotel near the new Union Station site at Toronto.

The McLaughlin Carriage Company of Oshawa, intend to erect a four-storey and basement factory and warehouse, corner of Church and Richmond Sts., Toronto.

Plans for the new Hotel Fernie, at Fernie, B.C., are being prepared. The building, when completed, will be the finest in the Kootenays, costing in the neighborhood of \$50,000.

In a report to the St. John, N.B., School Trustees Dr. Bridges states that many of the schools are overcrowded and there is a possibility that a new school building will have to be erected.

Tenders are being asked for the construction of freight offices and sheds by the C.N.R. at Saskatoon. It is also possible the company will call for ten-

ders for their new station at Saskatoon this fall.

The number of permits in Toronto for the first ten months of 1908 exceeds that for 1907 by 68, although the estimated value is \$3,442,533 less. October was decidedly active in the building line.

A handsome building in Belmont Park, Montreal, has been purchased by Lieut.-Col. Burland, for a tuberculosis dispensary. Plans are being prepared for its conversion into a hospital and dispensary, at a cost of \$20,000.

A syndicate of English capitalists have bought the site and building of Knox College, Spadina Avenue, and will erect thereon a twelve-storey departmental store. The outlay for the site and building will be one million dollars.

The contract for the new Grand Trunk Pacific elevator at Fort William has been let to James Stewart & Co. The price is in the neighborhood of a million dollars. The elevator will have a capacity of 1,000,000 bushels and will be absolutely fireproof.

N. Tessier, secretary, Department of Public Works, Ottawa, is taking tenders until October 27th for the construction of a drill shed for the school of gunnery, Quebec, and for the erection of a building for postal station D, Point St. Charles, Montreal.

New building regulations have gone into force in London. The application must be signed by the builder and all plans be submitted to the city engineer and the city architect, who pass upon them. If the plans are satisfactory the permit is issued; if not, the plans must be amended until made satisfactory.

Bailey and Clark, Toronto, are putting up a pair of semi-detached houses, to cost \$5,000. Other recent permits issued in Toronto include H. Galbraith, pair of houses, \$5,200; John E. Hoare, dwelling, \$6,500; A. L. East, three brick dwellings, \$9,000; George Birdsall, frame detached dwelling, \$12,000; Dr. F. L. M. Grasset, dwelling, \$12,000; W. F. Petry, two pair dwellings, \$11,000; T. Holmes, pair of dwellings, \$5,000; Charles Parker, dwelling, \$5,500; H. B. Johnson, alterations to warehouse, \$14,000; Keltz Building Company, six pair dwellings, \$18,000; D. J. Hayes, pair of dwellings, \$5,000.

Companies Incorporated.

The firm of Bedard & Lepage, plumbers, Montreal, has been registered.

The Westmount Plumbing & Heating Co., Montreal; capital, \$90,000; to conduct a general plumbing, heating and steamfitting business and to manufacture plumbing, engineering, electrical goods, hardware and bicycles. Provisional directors: W. A. Rousseau, J. Giguere, M. A. Cardinal, J. J. Meagher and J. E. Coulin, all of Montreal.

PLUMBING AND HEATING MARKETS

MONTREAL.

November 14.—Trade is moving along briskly and with construction work keeping up in good shape, jobbers express themselves satisfied with conditions. Many foundations are even now being laid down, the builders evidently having the intention of working through part of the winter at any rate, so that there should be a fair number of plumbing jobs offering well into the new year. In fact one or two plumbers say that they are in easy street so far as the winter is concerned, being already booked up, and while others are not so fortunate, there is not a great deal of complaint as to the prospects. Jobbing work keeps up well, especially in the country districts, old houses being modernized in their heating and other fixtures.

Prices are keeping firm in most lines. Solder has gone up $\frac{1}{2}$ c, while on the other hand there has been a continuance of the cutting in the cheaper lines of brass goods. The better grades, however, have maintained their price, and if the copper market continues to advance, brass will go with it. Soil pipe, lead pipe, and enamelware are moving especially well this month. Apart from the consuming demand there is of course the heavier call due to the approach of winter freight rates.

IRON PIPE—Trade has improved lately, jobbers experiencing heavier orders. The country demand continues to show good strength. Prices are unchanged in pipe as well as cast iron and malleable fittings.

SOIL PIPE—Soil pipe has been stimulated during the last fortnight. Plenty of pipe is being used, while there is more stocking up taking place. The market is firm and prices are unchanged at:—Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—This line has been moving more freely, a large number of houses now being ready for piping. As most of the pipe being ordered is used stocks in plumbers' shops generally are still light. The market is firm, and we quote pipe and waste at 30, traps and bends at 50.

SOLDER—The demand still continues good, although orders are somewhat on the light side. Roofers continue busy, so with the number of jobbing orders going on, little solder seems to be going into stock. The market has advanced slightly and we now quote 19 $\frac{1}{2}$ c for half and half, and 18 $\frac{1}{2}$ c for wiping.

ENAMELWARE—A very busy month has set in and manufacturers and jobbers report good orders. November looks to be turning out a much better

month than October. Prices are unchanged on the high class goods.

BRASS GOODS—Although there has been cutting in inferior grades the better class article keeps up well, despite the quietness of the demand. Trade, however, looks to be brightening up, and if the advance in copper continues, the brass market will get much firmer.

RADIATORS AND BOILERS — A very busy time has set in, many houses being now ready for their heating apparatus. With the manufacturers' supplies in good shape there has been no delay in supplying orders promptly. We continue to quote:—Radiators at 52 $\frac{1}{2}$ and boilers at 50 and 10 off. Steam-fittings are 66 2-3 off, with a good demand.

METALS—All the markets have firmed up consequent to the presidential election, and the speculation that usually accompanies such an event. The great rally in demand has not yet appeared in the States, but good business is being done locally. Tin has been advanced. We quote:—Ingot copper, \$14.50; ingot tin, \$33; lead, \$3.60; pig iron, Middlesboro No. 1, \$18.50 to \$19. Summerlee, \$20. Heavy scrap red brass is 10 $\frac{1}{2}$ c; light copper, 10 $\frac{1}{2}$ c; heavy lead 2 $\frac{1}{2}$ c.

TORONTO.

Nov. 14.—The trade during the past two weeks has been fairly good. Jobbers consider the future outlook promising. Country plumbers are well stocked up for the winter while the jobbers in the city are reporting an increasing business owing to the unusually large number of building permits issued during the past month. Inside work in all the new houses is being rushed. The cold snap reminds house-builders that there must be no delay. Lead pipe is in good steady demand and in enamelware a fresh price list will go into effect about the middle of the month, of which dealers have already been advised.

BRASS GOODS—This line is still selling slow. Some price-cutting is still going on although jobbers do not care to admit it. One dealer said this was the result of there being too many persons in the business. The ruling prices now are: Standard compression work, 70 per cent.; fuller work, 75 per cent., with No. 0 basin cocks, 80 per cent. Flatway stop and waste cocks are 70 per cent., while roundway remain at 50 and 10. Compression bath cocks (No. 4) are now quoted at \$1.50; and No. 4 $\frac{1}{2}$ Fuller's, \$1.85. Fuller bibs are at 75 per cent.

ENAMELWARE—New lists have been published and distributed by the

Standard Ideal Sanitary Company. The matter of most interest is that the special grading will be withdrawn after Nov. 15, when 30 per cent. off the new catalogue go into effect.

IRON PIPE—A fair business is being done and there is no direct change. The following figures still prevail: 1-in. black, \$5.11, and 1-in. galvanized, \$6.76. Cast iron fittings, 65 and 70 per cent.; flanged unions, 55; nipples, 70 and 10; malleable lipped unions, 55. Malleable fittings are unchanged at from 37 $\frac{1}{2}$ per cent.

SOIL PIPE—There is really very little doing owing to the frozen condition of the ground. In the majority of centres few services will be installed after the middle of this month. Prices, which are unchanged, are: Light pipe, 60; fittings, 70 per cent. Medium and extra heavy pipe and fittings are 70 per cent.

LEAD PIPE—A good steady trade is being done. Calking lead is from 4 $\frac{1}{2}$ c to 5c per pound. Traps and bends, 50; pipe and waste continue at 30 per cent.

SOLDER—There has been a change and the price is half a cent per pound higher. This is caused by the alteration in quotations of raw material rather than any change in the market. Tin and lead fluctuate a great deal and are rather erratic at the present time. Wiping solder is now 19c and half-and-half 20c per pound. The demand is good.

BOILERS AND RADIATORS—Heating goods are being rushed and, while many orders cannot be expected this month preparations are being made for next season's stock. Prices are unchanged.

Condensed or "Want" Ads.

MISCELLANEOUS.

HIGH CLASS COLOR WORK.—Commercial stationery, posters. The Hough Lithographing Co. Limited, Office, No. 3 Jarvis Street, Toronto Telephone, Main 1576. Art, good workmanship business methods.

650,000 Not one of the 650,000 retail merchants who have bought a National Cash Register would think of doing business without it. The National Cash Register Co., F. E. Mutton, Canadian Manager, cor. Yonge Street and Wilton Avenue, Toronto, Ont.

ADDING TYPEWRITERS write, add or subtract in one operation. Elliott Fisher, Limited, 129 Bay Street, Toronto.

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A PLUMBING, Heating and Electrical Business for sale in good Ontario town. Stock carried upwards of \$4000, or might sell an interest to good man conversant with plumbing and heating and capable of managing the business. Address Box 749, PLUMBER AND STEAMFITTER, Toronto. (21)

DUPLICATING DEVICES.

IF INTERESTED in a Duplicating Machine for getting out circular letters, reports, price-lists, etc., or for printing various office forms, write for booklet and samples of work. The "POLYGRAPH" is the newest, latest and best, and sells for a lower price than the others. Is unexcelled by any similar device on the market. F. W. Tenney, Canadian Sales Agent, 123 Bay St., Room 116 Stair Building, Toronto, Canada. (11)

The Honeywell System of Hot-Water Heating

14,000 Systems in Use in America.



HONEYWELL
HEAT GENERATOR

We have recently made arrangements to manufacture Honeywell Heat Generators in Canada and have arranged with the leading boiler and radiator manufacturers and jobbers of the Dominion to carry our specialties in stock.

While our Canadian representatives will give their attention to making the trade on this side acquainted with the merits of the Honeywell System of Hot Water Heating and render engineering advice to the interest of the fitters, we will not fill orders direct for our specialties, but will supply the trade entirely through the established Canadian dealers.

The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



The Honeywell Heating Specialty Co.,

Plant and General Office, Wabash, Indiana

M. D. Tillman, Box 1113, Montreal, Canadian Representative.

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All our **Bronze Powders** and **Liquids** have the distinction of being **Guaranteed**. All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

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in Canada has some want which could be satisfied by a small condensed advertisement in our paper.

We reach twice each month almost every plumber and steamfitter from one end of Canada to the other. It seems reasonable to suppose that some one of our readers will want to buy just what you have to sell, or will want to sell just what you have to buy.

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Get in line and let us prove to you that the

GENUINE

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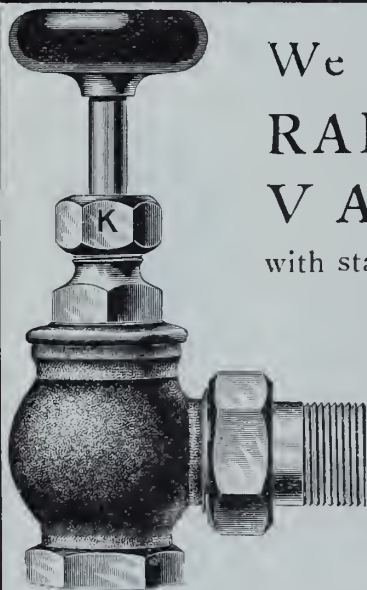
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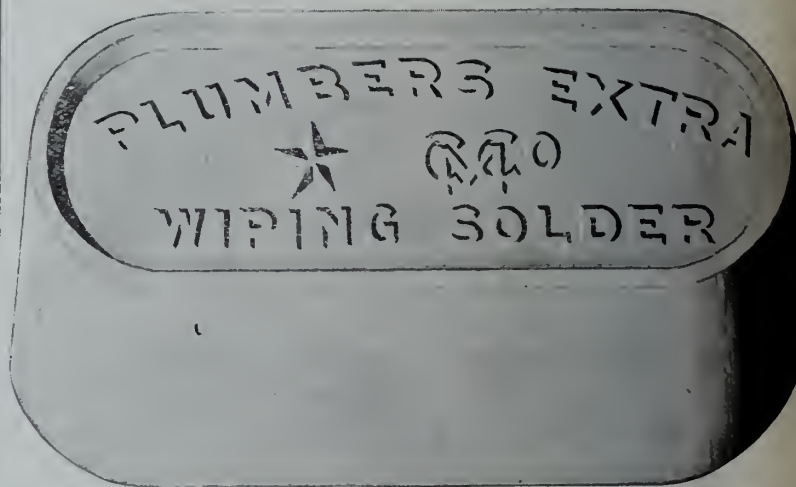
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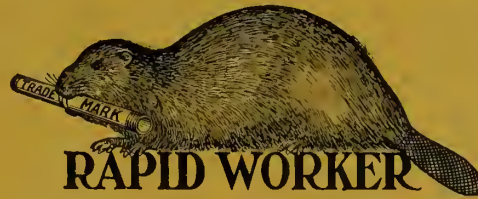
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Vol. II. No. 23. (New Series).

Publication Office : 10 Front St. East, TORONTO, DEC. 1, 1908.

Old Series, Vol. XX. No. 23

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It is a little early for holiday greetings, but I wish to express my thanks to the trade for their many orders in 1908, and to wish all my customers a Merry Christmas and a Prosperous New Year.

I also solicit a continuance of your confidence and will do all I can to ship every order promptly and merit an increasing share of your enamelware requirements.

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The Honeywell System has met with eminent success in America. It is used in every state of the Union where hot water heating is installed. It is not the coming but the system in vogue in the States, and it will be only for any fitter of Canada to try out one job according to our instructions to prove beyond question that the Honeywell System is all that is claimed for it.

Honeywell Heat Generators will cure sluggish jobs and double the efficiency of jobs where the piping and radiators are too small for the gravity system. A number of Generators have been attached to existing plants in Winnipeg, Ottawa, Montreal, St. Hyacinthe, St. John and other Canadian points with entirely satisfactory results. Let us refer you to a number of them, also to new jobs installed in the Dominion according to our instructions. Write for "Book of Plans" and "Illustrated Folders" of jobs installed in all parts of the country.



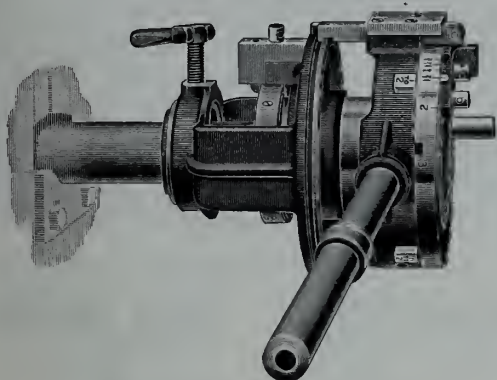
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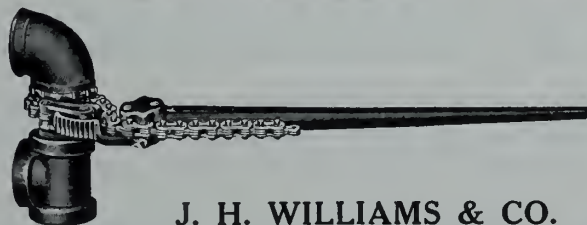


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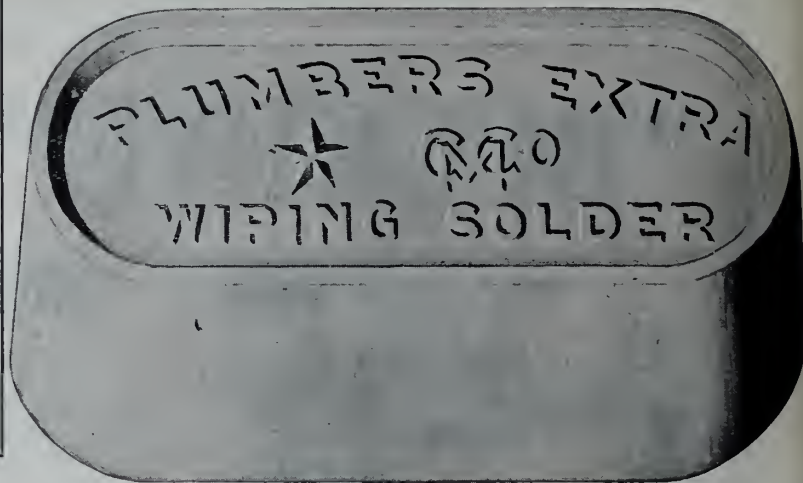
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Our Brass Work is carefully inspected, rigidly tested, beautifully finished and after leaving works is guaranteed for five years.

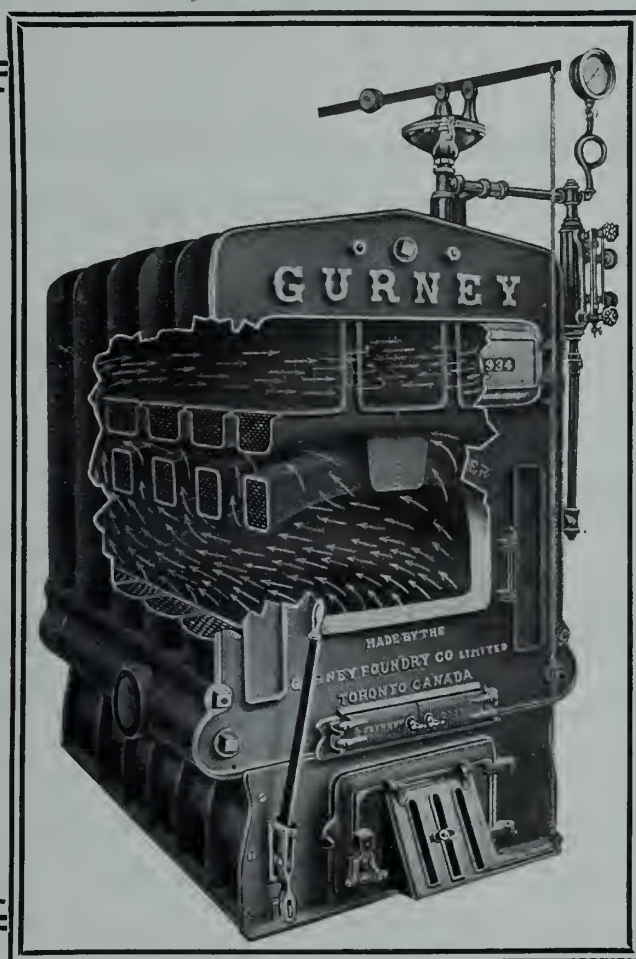
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You cannot make a better investment for 1909 than a year's subscription to this magazine. Each number will prove so interesting to members of your home that they will eagerly look forward to the arrival of succeeding issues.

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Odd Economies Make Big Businesses Pay
Stealing the Letters of Corporations
The Pasture Lands of Advertising
Increasing Small Wages by Taking Up
Side Lines
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Political and Commercial Affairs.

Did a Woman Inspire the Ferment in the
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What Population Can the United States
Sustain?
How Canada Might Have Lost the Loyalists
A Danish Statesman Embezzles Seven
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Converting a City from its Evil Ways
The War Against Trusts in America
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Short Stories.

The Enchanted Profile
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A Gondola Dinner That Cost \$20,000
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Miscellaneous.

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Some Noted Exponents of Early Rising
Satirizing Rockefeller's Autobiography
Concerning Puns and Punsers
The Box Office Test of Human Greatness
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MONTREAL, TORONTO AND WINNIPEG, DECEMBER 1, 1908

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DISTRIBUTING COLD THROUGH PIPES.

The first international congress on refrigeration has just met in Paris. Its object is to awaken interest in the industrial and domestic applications of refrigeration. Artificial refrigeration originated in France, but it has reached its greatest development in America. Cold is actually distributed to private houses in Boston, New York, St. Louis, Atlantic City, Baltimore, Norfolk, Los Angeles, Denver and Kansas City, through systems of pipes which vary in length from 1 to 18 miles. The financial results show a still greater variance. The business is very profitable in some places and unremunerative in others. The Denver company, for example, has been forced to suspend operations.

In general it has been found advantageous to concentrate the production of cold in large establishments and to employ the ammonia process. There are two methods of distribution: by chilled brine and by liquefied ammonia, which is allowed to expand at the place where the refrigeration is desired. The latter method is preferred, and is used exclusively in the newer installations, although it requires a triple system of pipes. Both methods are in use in Boston and New York. In the method in which ammonia is distributed the tightness of all joints is very important, as leakage may entail losses that would make the enterprise unprofitable. Some companies use joints welded with the aid of thermite and insert expansion joints at intervals. The iron pipes through which the ammonia flows are inclosed in tile pipes which rest on concrete foundations. It is rumored that a French company will establish a system of distribution of cold in Cairo, Egypt. The project includes a central station for the condensation of ammonia, 3 miles of pipes for the distribution of

the liquid ammonia to a number of sub-stations, where it will be used to refrigerate brine, and 20 miles of pipes for the distribution of the cold brine to consumers.

SUPPLY MEN CAN HELP.

Manufacturers and jobbers should regard with keener interest than they do the great organizing work now being done by the allied associations of master plumbers. In many ways they are directly interested in the status of the plumbing industry. Each step that is taken to uplift the class of men with whom they have to deal is so much additional insurance in respect to their business transactions.

The aims of our pioneer plumbers in their association work are comprehensive and progressive. They want to eradicate all the evils that now beset their industry and keep back its legitimate development. They desire to advance the class of men who are now indiscriminately entering the industry; to widen the knowledge of the principles of scientific plumbing; to improve the plumbing laws; and in so doing place the industry on a higher plane in the eyes of the community than it occupies at present.

Furthermore, the associations, amongst other things, wish to strike at the great evil of price cutting, at the employment of cheap goods, and at shoddy work; and so safeguard the interests of plumbers in all directions that every man can in the words of the Secretary of the National Master Plumbers' Association, in his recent circular to the Vice-Presidents, "Control an honest day's pay for an honest day's work."

The manufacturer and jobber in regarding these aims can easily see that by their accomplishment his business relations with plumbers generally are equally safeguarded. With less price cutting there will be less failures, with the spread of plumbing knowledge there will be a wider use of the better class of goods, and there will be the additional assurance of dealing with a class of men whose reliability as regards all business transactions will be in a measure guaranteed by their membership in the Canadian organization. It is, therefore, to the interests of manufacturer and jobber that they should take more than passing notice of the work now going on under extreme difficulties. It is in their power in a variety of ways to help the National and Provincial Associations, both directly and indirectly. They could with advantage take a lesson from Mr. Knight, of the Amherst Foundry Company, who is a warm worker in the cause of association work, and who recently sent the National Association a

complete list of plumbers in the Maritime Provinces—a list which was of the greatest help. Those who are farsighted enough to aid can easily find ways to do so.

PLACE TRADE ON A HIGHER PLANE.

Few of us, I think, value the new inspirations and incentives for greater application and larger appreciations; the better ways by interchange of thought, for greater accomplishments, and yet above all of these, the enlargement of the life and the broadening of the man resulting from our organization, said William Mitchell, Springfield, Ohio, in an address before the seventeenth annual convention of the Ohio State Association of Master Plumbers.

The problem of evil is an ever present tragic element in human life. Everywhere it must be faced in some form. No one lives long in this world without coming to the consciousness that some things are right and some things are wrong. With the knowledge of this distinction comes the equally clear conviction of obligation to choose and to do the right. Choice of right implies opposition to all wrong, and we must not expect harmony between the two. And so I wish to inquire first, who will make us great—great as we should become? Will it be the selfish, or the charitable; the men with brains and no hearts, or the men with hearts and no brains; or will it be the men with both hearts and brains—in short, will it be the broad men, or the narrow men?

Union labor denies the boy, so far as it can, his inherent right to learn a trade; an act that we say is un-American and an odium to men who live in the higher altitudes of their being. What of the master plumber who denies the faithful journeyman the right to join his craft and association? Is he the fellow to make us great, great as we should become? What of the local association that is found in chaos and despair because some one has aspired to become a master plumber? Is such an association to be one of the builders of our future greatness? Should not each man and each local do and be that which it would be all right for every man and all locals to do and be? Or would greater greatness accrue from each being a law unto himself? Is the stress and strain of competition, which signifies the outdoing of the other person, and of all others, and has made of them our platform, to be the foundation stone for our future greatness; or shall our great foundation corner stone be the Golden Rule?

Are the associate members of the larger cities, who pounce down upon the helpless ones in the country and make them take every job of size at cost, to be looked to for the dependable helpfulness and for our rightful expectation of future greatness?

In some parts of Kentucky, we are told, the swine run at large and feed upon the nuts that fall from the tree. When a farmer wishes to butcher, he notifies his neighbors to put up their hogs. The farmer then takes his rifle—the field is his—and lands his own.

I wish to propose for your consideration: Do you think it would build up our future greatness if, when our big fat jobs are ready and ripe for the killing we were to notify our neighbors to put up their hogs, only that we might land our own?

Are there not many ways in which business at home could be largely increased in volume and also made more profitable? Could not one's excess time and energies be made a more profitable source of revenue in an earnest and aggressive endeavor to improve conditions than by fighting new aspirants and neighbors? If not a failure in steam or hot water heating in all of this great State of Ohio were known, would there not be double the demand for such work? If every job of plumbing were entirely satisfactory, would not the demand for such work grow

more rapidly? If so, then would not a united endeavor and agreement for a higher standard of work be a profitable alternative for war? If everybody were to help everybody else, would it pay? Is it not an awful delusion to suppose that a competitor's failure to instal successfully a piece of work will help us, who can do the work? Had he succeeded, would not the architect and owner have lauded the thing itself rather than the man who did the work? And would not the lauding have brought to you your friends for a similar job? Has not the failure killed the business for three squares in every direction, and left you sitting a pessimist and crying "hard times?" Is not the largest element in fight, the fighting and bearing down of the standard of workmanship and material used? Then would it not pay to see the new rival and assist him to hold up the standard; and does it really pay the rover to rove? Is cheapened product and cheapened reputation, which means inferiority all along the line, including a cheaper patronage, to build for us a great future? Or would we the better begin to live nearer to the limit of our possibilities as master mechanics and business men, not as feeble worms of the dust, but as stalwart ideals, clean, broad and charitable men, such as you and I admire and love to see?

A general toning up should pave the way and prepare the public for a willingness to pay us a more just compensation for our services. Does not the character of the men, and the general environment, prepare one and make him willing and ready to pay a big price, even before making inquiry, providing the general tone of the place is high? And is not the reverse true, and do we not expect a low price to be named, and are we not almost unconsciously unwilling to allow big profits when we find ourselves faced by a sort of Weary Willie merchant or clerk, and a generally dingy and spittoon environment? Is true economy stinginess and meanness? May it not be more properly wise expenditure from a broad standpoint? Might it not pay to cleanse up and tone up a little?

Do you say these methods are too slow? Is not everything that is great in life the product of slow growth? Mushrooms attain their full power in a night; oaks require decades. A fad lives its life in a few weeks; a philosophy lives through generations and centuries.

Can we not turn our faces to the future with confidence and trust, and yet be true to ideals, broad, helpful, patient with human weakness, strong to do the right, assisting one another?

VENTILATED CARS IN CHICAGO.

After a series of experiments lasting more than a year, a new ventilating system will be tried in the city railway cars of Chicago. The general scheme of this system, according to the Engineering Review, provides for a steady supply of fresh air; the raising of the temperature of this air to 60 degrees or more before it begins to circulate; introduction of the fresh air from the bottom of the car and escape of "used" air from the top, and a minimum of heating cost consistent with warmth. Street car companies, the board of supervising engineers, the division heads in the health department and various architectural and civil engineers have collaborated in devising the new system.

The Pittsburg Master Plumbers' Association has offered as a means to interest their members, as well as non-members, in association work and attract them to the regular meetings this winter a number of valuable prizes, donated by various manufacturers and others for those who will have the best percentage of attendance at the end of the season.

Treating and Disposing of Sewage

Recommendations of the Royal Commission on Sewage Disposal in the Fifth Report of the Commissioners.

As early as 1857 a commission was appointed in England to inquire into the matter of sewage disposal as also the applying of it to beneficial and profitable purposes.

Up till 1847 laws were in force in England forbidding the emptying of faecal and other similar foul matters into the sewers, but at this time they were repealed and exactly the opposite condition was enforced.

Modern sanitary engineering can be said to practically date from this time.

The following is the complete summary of the conclusions and recommendations of the Royal Commission as set forth in their fifth report, just published. The report is very full and covers amongst others the following subjects: preliminary treatment of sewage; sedimentation and septic tanks; purification of sewage by artificial filters; purification by treatment on land; methods of disposal of sewage sludge; nuisance from smell at sewage works; storm water sewage; standards and tests; pollution of rivers; etc. The last chapter of the report follows:

THE COMMISSIONERS' RECOMMENDATIONS.

It is practicable to purify the sewage of towns to any degree required, either by land treatment or by artificial filters, and there is no essential difference between the two processes. The main questions, therefore, to be considered in the case of a town proposing to adopt a system of sewage purification are, first, what degree of purification is required in the circumstances of that town, and of the river or stream into which its liquid refuse is to be discharged; and, secondly, how the degree of purification required can, in the particular case, be most economically obtained.

We find that it is generally desirable to remove from the sewage, by a preliminary process, a considerable proportion of the grit and suspended matters, before attempting to purify the sewage on land or filters.

Sedimentation Tanks.

Two to three hours quiescence is usually sufficient to produce a tank liquor fairly free from suspended solids, but owing to the fact that some sewages contain a larger proportion than others of solids that settle very slowly, no general rule can be laid down as to the neces-

sary period of quiescence. With this form of treatment the deposit in the tanks should be frequently removed.

The amount of settlement affected does not depend alone upon the period of flow, but upon a number of other factors. If the tank liquor is to be treated upon filters of fine material, the period of flow should generally be from 10 to 15 hours. The tanks should be cleaned out at least once a week.

Septic Tanks.

All the organic solids present in sewage are not digested by septic tanks, the actual amount of digestion varying with the character of the sewage, the size of the tanks relative to the volume treated, and the frequency of cleansing. With a domestic sewage, and tanks worked at a 24-hours rate, the digestion is about 25 per cent. The liquor issuing from septic tanks is bacteriologically almost as impure as the sewage entering the tanks. Domestic sewage which has been passed through a septic tank is not more easily oxidised in its passage through filters than domestic sewage which has been subjected to chemical precipitation or simple sedimentation.

No definite rules can be laid down as to how long a septic tank should be run without cleaning. In the case of small sewage works (serving populations of say 100 to 10,000 persons), the tanks should generally be allowed to run, without cleaning, so long as the suspended matter in the tank liquor shows no signs of affecting the filters injuriously. For larger works it would generally be advisable to run off small quantities of sludge at short intervals of time.

The rate of flow through a septic tank is a matter in which the needs of each place require special consideration, but at few places should the sewage be allowed to take longer than 24 or less than 12 hours to flow through the tank. In no case should less than two tanks be provided, and they should be arranged so that, if necessary, one tank can be used alone. As regards digestion of sludge and quality of tank liquor, a closed tank possesses no advantages over an open tank. There is less risk of nuisance if the tank and the feed channels to the filters are covered in.

By passing septic tank liquors through tanks of a size sufficient to hold about one quarter of the day's flow, with the

addition of from 2 to 3 grains of lime per gallon to the liquor, the suspended solids in the liquor are materially reduced, a considerably larger quantity of the liquor can be treated per cube yard of filter, and the offensive character of the liquor is largely destroyed.

Chemical Precipitation.

In the case of sewages which contain certain trade waste, and strong sewages from water-closet towns, it is generally desirable to subject the sewage to some form of chemical treatment before attempting to oxidise the organic matter contained in it. In most cases careful chemical precipitation materially aids the deposition of the suspended solids, and facilitates subsequent filtration. No general rule can be stated with regard to the capacity of precipitation tanks. With continuous flow, an eight hours rate is usually sufficient to produce a fairly good tank liquor from a domestic sewage of average strength. If sewage is allowed to remain quiescent in the tank, two hours settlement would usually suffice.

In the absence of special circumstances favoring a particular plan, it would appear that there is very little difference in annual cost between the various methods of tank treatment when taken in conjunction with the cost of subsequent filtration through percolating filters, assuming that the kind of filter adopted in each case is that which is best adapted to the particular tank treatment provided.

Filters.

Within ordinary limits, the depth of a contact bed makes, practically, no difference to its efficiency per cube yard. We think that it would be generally inadvisable to construct contact beds of a greater depth than 6 feet or of a less depth than 2 feet 6 inches. For practical purposes and assuming good distribution, the same purification will be obtained from a given quantity of coarse material, whether it is arranged in the form of a deep or of a shallow percolating filter, if the volume of sewage liquor treated per cube yard be the same in each case.

With regard to percolating filters of fine material, if the liquid to be purified were absolutely free from suspended and colloidal solids, and if thorough aeration could be maintained, the statement just made for filters of coarse material might possibly hold good for filters of fine material also. In practice, how-

ever, these conditions can scarcely be maintained with large rates of flow, and we think that the greatest efficiency can be got out of a given quantity of fine material by arranging it in the form of a shallow filter rather than of a deep filter. But we are not in a position to make an exact quantitative statement as to the difference in efficiency of the two forms.

The amount of sewage which can be purified per cube yard of contact bed or of percolating filter varies—within practical limits—nearly inversely as the strength of the liquor treated. This statement is based on the assumption that the size of the material of which the filter is composed is, in each case, suitable to the character of the liquor treated, and that the material is arranged at the proper depth to secure maximum efficiency. Detailed particulars as to the amounts which can be treated per cube yard of filter are given on page 117.

Taking into account the gradual loss of capacity of contact beds, a cubic yard of material arranged in the form of a percolating filter will generally treat about twice as much tank liquor as a cubic yard of material in a contact bed. In the case of sewage containing substances which have an inhibitory effect upon the activity of micro-organisms, the working power per cube yard of filter of either type may be more nearly equal. This point, however, is not clearly established.

Percolating filters are better adapted to variations of flow than contact beds. Effluents from percolating filters are usually much better aerated than effluents from contact beds, and, apart from suspended solids, are of a more uniform character. On emptying a contact bed, the first flush is usually more impure than the average effluent from the bed. The risk of nuisance from smell is greater with percolating filters than with contact beds. With percolating filters there is apt to be nuisance from flies, especially with filters constructed of coarse filtering material. In the warmer months of the year, such filters swarm with members of the Psychodidae, which, though appearing to breed and develop in the filters, may usually be seen in large numbers on the walls of houses, or buildings close to or on the works.

Treatment of Sewage on Land.

There is no essential distinction between effluents from land and effluents from artificially constructed filters. Effluents from those soils which are particularly well adapted for the purification of sewage contain only a very small quantity of unoxidised organic matter, and are usually of a higher class than effluents from artificial filters as at present constructed and used. Ef-

fluents from soils which are not well adapted for the purification of sewage may often be very impure.

Sludging of Mill Dams.

In any case in which the Rivers Board should be of opinion that the sludging of a mill dam by turning the accumulated sludge into the stream would give rise to a nuisance, and that it would be financially practicable for the mill owner to adopt some other method of cleansing the dam, the Rivers Board should be empowered, by notice, to direct the mill owner not to turn the sludge into the stream. It should be provided that any mill owner deeming himself aggrieved by such a direction, might, within some fixed period, appeal to the Central Authority. The decision of the Central Authority should be final.

Should any cases arise, in which it is important that the sludge should not be turned into the stream, but in which the Rivers Board are of opinion that the cost of adopting any other method of cleansing the dam would be prohibitive to the millowner, we recommend that the Rivers Board should be empowered to represent the case to the Central Authority, and that the Central Authority should be empowered, after due enquiry, to direct that the sludge shall not be turned into the stream. If the Central Authority should be satisfied that the cost of adopting some other method of cleansing the dam would be greater than the millowner could be reasonably called upon to bear, they should be empowered to direct that a portion of the cost should be borne by the local authorities whose districts would be benefited.

Effect of Trade Effluents.

All the trade effluents of which we have had experience interfere with or retard processes of purification to some extent, but we are not aware of any case where the admixture of trade refuse makes it impracticable to purify the sewage upon land or by means of artificial processes, although in certain extreme cases special processes of preliminary treatment may be necessary.

Nuisance From Smell.

All sewage works are liable, at times, to give off unpleasant smells; they should, therefore, be situated away from dwelling houses, wherever this is practicable. The nuisance is apt to be considerably greater where the sewage contains brewery refuse in any quantity; but, on the other hand, the presence of some trade effluents, such, e.g., as iron salts or tarry matters, tends to render the process of purification less offensive. The extent of the risk of nuisance depends, however, not only on the character of the sewage, but also on the method of treatment adopted.

Choice of Method of Treatment.

The selection of a method of sewage disposal should depend primarily on local conditions. If a sufficient quantity of good land, to which the sewage can gravitate, can be purchased for about £100 an acre, land treatment would usually be the cheapest method to adopt. In cases where only clay land is available, it would generally be cheaper and more satisfactory to provide artificial filters.

Given conditions favorable to each process, there is little difference as regards cost between any of the different forms of tank treatment when these are considered along with the cost of subsequent filtration.

Single contact will, generally, only yield a good effluent where the sewage to be treated is weak, and then only after good preliminary treatment. For the purification of partially settled weak sewage, and for well, as also for partially, settled sewage of average strength, if the case is one in which a good effluent is required, double contact is necessary, while if a strong sewage has to be treated, triple contact is necessary, unless the preliminary treatment is exceptionally good.

In nearly every case a greater rate of filtration per cube yard can be adopted if the material is arranged in the form of a percolating filter, than if it is used in contact beds. In many cases the rate of filtration through percolating filters may be double or nearly double what it could be with contact beds.

Where the liquor to be treated contains much suspended matter, it is usually advisable to construct filters, whether contact or percolating, with coarse filtering material. Where the preliminary treatment has effectively removed the greater part of the suspended matter, it is best to use fine material in the filters.

Storm Overflows on Branch Sewers.

Storm overflows on branch sewers should be used sparingly, and should usually be set so as not to come into operation until the flow in the branch sewer is several times the maximum normal dry weather flow in the sewer. No general rule can be laid down as to the increase in flow which should occur in the branch sewers before sewage is allowed to pass away by the overflow untreated. The Rivers Board, or in districts where there is no Rivers Board, the County Council, should have power to require the local authority to alter any storm-overflows which, in their opinion, permit of an excessive amount of unpurified sewage to flow over them. The local authority should have the right to appeal to the Central Authority in any case in which they consider that the requirement of the Rivers Board is unreasonable or im-

practicable of fulfilment. The general principle should be to prevent such an amount of unpurified sewage from passing over the overflow as would cause nuisance.

Treatment of Storm Water Sewage.

As a general rule, special stand-by tanks (two or more) should be provided at the works, and kept empty for the purpose of receiving the excess of storm water which cannot properly be passed through the ordinary tanks. As regards the amount which may be properly passed through the ordinary tanks, our experience shows that in storm times the rate of flow through these tanks may usually be increased to about three times the normal dry weather rate without serious disadvantage.

The overflow at the works should be made from these special tanks, and should be arranged so that it will not come into operation until the tanks are full. Special filters which are only used in times of storm are not usually efficient, and should not be provided. Any extra quantity of sewage arriving at the works in storms, which has to be filtered, should be treated on the ordinary filters, which should be made sufficiently large for the purpose.

As regards the size of the stand-by tanks, the amount of storm water sewage to be filtered, and the arrangements generally for dealing with the storm sewage at the outfall works, the Rivers Board or the County Council in areas in which no Rivers Boards have been established, should have similar power to that which we have proposed in regard to overflows on branch sewers, and the local authority should have a similar right of appeal to the Central Authority. In most cases it will probably suffice to provide stand-by tanks capable of holding one-quarter of the daily dry weather flow, and it will not be necessary to provide for filtering more than three times the normal dry weather flow. Under the arrangements which we recommend no storm sewage arriving at the outfall works would be discharged without some settlement.

Separate Systems of Sewers.

In any case in which a local authority wishes to adopt the separate system of drainage for the whole or any part of their district, they should apply to the Central Authority, and that Authority should be empowered to confer on the local authority, by order, such powers as are required. As regards the powers that are required, the provisions which are generally contained in local Acts in respect to this matter seem to be defective. If separate sewers are provided, the local authority should have a clear power to enforce the provision of separate drains, but the local Acts to which our attention has been drawn do

not modify the powers of the local authority under the general law in regard to by-laws as to the drainage of houses. Moreover, the powers of the local authority should not necessarily be limited to new streets and new houses. As a general rule, the expense of altering existing drains should fall on the local authority, and there may be some instances in which it would be equitable that they should bear some portion of the additional cost even in the case of new roads. The Central Authority should, therefore, have power to include in their order such provisions for the allocation of the cost as they consider equitable, having regard to the local circumstances.

Standards for Sewage Effluents.

Our terms of reference require us to have regard to the "economical and efficient" discharge of the duties of local authorities, and in view of the importance of not requiring a local authority to incur any further expenditure on sewage disposal than the circumstances of its area require, we feel strongly that the law should be altered so as to allow local circumstances to be taken into account.

We recommend that the Central Authority should determine the nature of the tests which are to be applied for the purpose of standards, and that it should be made the duty of the Rivers Board, or of the County Council in areas not under the jurisdiction of a Rivers Board, to determine, from time to time, subject to appeal to the Central Authority, what standards should be adopted. In the first instance it would be convenient that the Central Authority should prescribe one standard for all non-tidal waters, in place of the existing statutory provisions. It would then rest with the Rivers Board or County Council to fix, subject to appeal to the Central Authority, a higher or lower standard in any case in which they were of opinion that the circumstances required or justified a different standard.

We further recommend that no action should be allowed to be brought in respect of damage alleged to be due to the discharge of an effluent which complies with the standard fixed for the water into which it is discharged, but that in such cases complaint should be made to the Central Authority, and, if a prima facie case is made out, that Authority should ascertain whether the complaint is well founded, and should be empowered to fix a different standard if the circumstances are shown to require it.

In cases where it is alleged that the effluent does not comply with the statutory standard, and that damage is caused by the discharge of such effluent, action should be brought in the ordin-

ary courts. But any questions arising as to whether the effluent complies with the statutory standard, or as to whether the damage has been caused by the discharge of the effluent in respect of which complaint is made, should be referred by the court to the Central Authority for determination. The costs of such determination should be borne by the parties to the action in such proportions as the Court may determine. Power should be conferred on the Central Authority to suspend, from time to time, the operation of any standard, to allow time for the construction of works, or for any other reason which, in their opinion, justified such suspension.

Tests for Sewage Effluents.

According to our present knowledge, an effluent can best be judged by ascertaining, first, the amount of suspended solids which it contains, and, second, the rate at which the effluent, after the removal of the suspended solids, takes up oxygen from water. In applying this test it is important that the suspended solids should be removed, and estimated separately.

For the guidance of local authorities we may provisionally state that an effluent would generally be satisfactory if it complied with the following conditions:—

(1) That it should not contain more than 3 parts per 100,000 of suspended matter; and

(2) That, after being filtered through filter paper, it should not absorb more than:

(a) 0.5 part by weight per 100,000 of dissolved or atmospheric oxygen in 24 hours.

(b) 1.0 part by weight per 100,000 of dissolved or atmospheric oxygen in 48 hours; or

(c) 1.5 parts by weight per 100,000 of dissolved or atmospheric oxygen in 5 days.

The Central Authority.

To secure the economical and efficient discharge of the duties of local authorities, and others, in regard to pollution, and adequately to protect the public health and the amenities of rivers, the statutory provisions in regard to these matters must be of an elastic character. The conditions of different cases vary to such an extent that the necessary control cannot, in our opinion, be provided by any direct enactment which could be enforced by the ordinary courts. Throughout our reports, this fact has been fully recognized, and we have proposed, in regard to many matters, that ultimate control should be vested in an adequately equipped Central Administrative Authority, and that, as far as practicable, the local Rivers Board should, in accordance with

Air Washing and Humidifying.

An Interesting Paper Read by W. A. Rowe, of the Buffalo Forge Company,
Before the Ohio Society of Mechanical Engineers.

regulations framed by the Central Department, act as a first tribunal.

Among the more important questions which have to be dealt with under the new conditions of administration which we are contemplating, are the following:—

(i.) Disputes between local authorities and manufacturers as to the terms and conditions on which trade effluents shall be admitted into sewers.

(ii.) The control of shell-fish layings so as to prevent the taking of shell-fish for human consumption from positions in which they are liable to risk of dangerous contamination.

(iii.) The protection of water supplies from pollution.

(iv.) The collection of information as to the water supplies available in various parts of the country.

(v.) The collection of information as to the need of water in various parts of the country.

(vi.) The settlement of standards for different reaches of water.

(vii.) Conferring powers on local authorities, in suitable cases, to provide separate systems of sewers for surface water and to enforce the provision of separate drains.

(viii.) The settlement of questions as to the extra amount of sewage which a local authority should be required to treat during storms.

There are also numerous questions in regard to the purification of polluting liquids which, in the interests of the public, have still to be worked out, and it is essential that the Central Authority should be properly equipped for undertaking such special investigations as they may from time to time find necessary, and for collecting and collating the work done by others. Since the date of our appointment considerable developments have taken place in regard to the disposal of sewage, and there is every reason to think that further changes will occur in the future. Unless the Central Department keep in close touch with all such changes, and from time to time report on them, it is not possible for local authorities throughout the country fully to utilise the results of valuable work which is being done at many places, and hence, to perform their duties in the most economical as well as efficient manner.

INVENTOR OF HEATING BOILERS.

John Henry Mills, a pioneer heating engineer and inventor of heating boilers, of Boston, Mass., died at his home in Faneuil, a suburb of that city, on Tuesday, October 6, in his seventy-fifth year. He was an authority on heating, and his work, "Heat—Its Application to the Warming and Ventilation of Buildings," is one of the standard books on the subject.

The first requisite of a successful washer is an intimate contact between the air and the water. The more finely the water can be divided the greater will be the contact surface, and, consequently, the greater degree of success realized. Hence a finely divided mist is essential. A nozzle has been devised with which an almost invisible, finely divided spray is obtained with a pressure of but 20 lb. per square inch. In this nozzle the outlet orifice is but 3-32 in. in diameter, yet it will deliver 3.5 lb. of water per minute. The result is obtained by giving the water a centrifugal motion which causes it to burst into spray. In the completed air washer these nozzles are spaced two per square foot of cross sectional area, a velocity of from 400 to 450 ft. per minute through the washer being maintained. Thus, where 42,000 cu. ft. of air per minute is to be handled, a cross section area of 93.5 sq. ft., with 188 nozzles, is provided.

The second important feature to be secured is thorough separation of the excess free moisture which is carried along by the air current. This is done by a series of galvanized plates, placed $\frac{3}{8}$ in. apart and containing bends 2 in. in length. There are usually six sections, the first three allowing a film of running water to cover them completely. The last three have slight projections which completely separate all traces of free moisture from the air. This eliminator thus presents a large washing surface upon which every particle of foreign matter will impinge.

Control of Humidity.

The proper control of the humidity is accomplished by controlling the temperature of the air in the spray chamber, and taking advantage of the law that air at any given temperature has a definite moisture absorbing capacity, this amount increasing as the temperature is raised. For example, air at 50 degrees and 70 degrees F. can absorb four and eight grains of moisture, respectively, per cubic foot, at which point it becomes saturated. If it is desired to maintain 50 per cent. humidity at 70 degrees F. in a building, it is only necessary that the air in the spray chamber be saturated at a temperature of 50 degrees F., and afterwards raised in temperature to that of the room, without the addition of any more moisture. In this way any desired humidity can be maintained. The best results are obtained by dispensing with temper-

ing coils entirely, depending on heated spray water to bring the temperature of the air up to the desired point. This circulating water can be heated in any type of heater, its temperature being controlled automatically by means of a thermostat in the spray chamber.

Design and Equipment.

The apparatus must be free from all necessity for constant personal attention. It must be easily accessible, the nozzles easily cleaned if such necessity should arise, and ample provision be made for keeping foreign matter out of recirculating water.

Usually a motor driven centrifugal pump is used, the water collecting in a settling tank at the base of the washer and being recirculated. Usually the settling tank is flushed out once a week and entirely new water provided. Some idea of the extent to which the cleansing effect may be carried may be obtained from recent tests made on the Carnegie Branch Library at St. Louis by William H. Bryan, consulting engineer. While not going into details, it is sufficient to say that, using lampblack, over 99 per cent. was removed by the washer.

Condensation May Be Prevented.

Objection has been raised that excessive condensation on windows might result from humidifying the air. It has been found that this can be obviated by maintaining a temperature in the spray chamber never higher than a mean between the temperature of the external air and that of the room. For example if we are maintaining a temperature 70 degrees F. in the building, with an outside temperature of 10 degrees, a temperature of 40 degrees in the spray chamber will prevent any condensation or frosting on the windows. This is true because the glass itself is at a temperature midway between the two extremes and, therefore, is unable to lower the temperature of the air to its dew point.

Humidity Lowers Temperature.

As a rule the fan system of heating and ventilating is used only when the outside temperature is under 60 to 65 degrees. Under these conditions an excessive humidity is absolutely impossible because of the fact that the air is raised in temperature before being brought into the room. When, however, the system is used throughout the year it oftentimes becomes desirable to get away from the high humidities quite common in warm weather. It is found

that the external air can be appreciably lowered in temperature during the warm months because the air in passing through the washer absorbs some of the moisture. The latent heat to vaporize this moisture is furnished by the air itself, hence the lowering in temperature. It is found that an absorption of from 0.8 to 0.9 grain per cubic foot gives a lowering in temperature of from 7 to 8 degrees. Greater reduction in temperature may be obtained, providing of course, the air already has not too high a percentage of humidity.

In the greater part of our warm weather this cooling effect is not accompanied by any unpleasant humidity. Where, however, this slight increase would cause inconvenience it is possible to produce a cleansing effect without appreciable absorption of moisture, with its consequent cooling effect, by merely flooding the eliminator plates and dispensing with the fine spray. Where exceptionally high humidities are encountered, it is possible to substitute a solution of calcium chloride, 28 degrees Baume. This solution will thoroughly wash the air without a particle being evaporated. It neither gives up nor will it absorb moisture.

In a recent test of the Carnegie Library installation, already referred to, with an outside temperature of 86 degrees and 40 per cent. humidity, an average temperature was maintained inside the building of 77.5 degrees with 70 per cent. humidity, this being an average temperature decrease of 8.5 degrees. It was found that a lower temperature was maintained in the room where the windows were kept shut.

Extracting Moisture From Air.

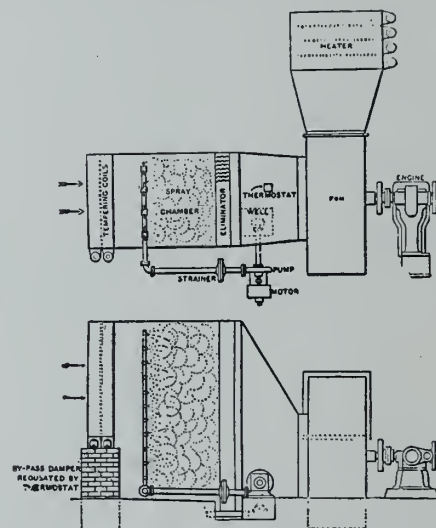
So far I have touched only on the humidifying or adding of moisture to the air. In some branches of industrial work it is necessary to extract the moisture from air, or to dehumidify it. This is particularly true in the case of drying many substances which cannot stand a high temperature. Among these might be mentioned gelatine and glue products, photographic paper, rubber, sulphur, matches, etc.

Where the material to be dried can stand the maximum probable temperature that we are likely to encounter in Summer weather, say 90 degrees, we can get sufficiently dry air at any time by the use of calcium chloride solution, 40 degrees Baume, in the air washer. This solution will extract moisture from the air, the amount depending on the strength of the solution. It is not necessary to use outside air in this instance. The air from the drying room can be returned to the washer where it is relieved of a portion of its moisture.

This chemical extraction of the moisture from the air liberates the heat of

vaporization, which results in raising the temperature of the air itself. This warmer and dryer air is then returned to the drying room, where it absorbs additional moisture from the material being dried. Of course, the calcium chloride solution is being continually weakened while this cycle is progressing. It is necessary to use an automatically-controlled evaporator, to which the solution is returned and re-concentrated.

A more simple solution of this problem can be effected where a sufficient supply of cold water is available. With a temperature of water of 50 to 55 degrees, it is possible to reduce the temperature of the air to 58 to 63 degrees, leaving but 5.5 to 6.5 grains of moisture per cubic foot in the air. By then reheating this air to 80 to 85 degrees, we would have a 50 per cent. saturation, in which condition the air will



Air Washing and Humidifying Apparatus.

readily absorb moisture. The large amount of cooling water necessary makes this plan too expensive in many localities, in which event the calcium chloride solution can be used with small expense.

Low Temperature Drying.

Again we have materials, such as photographic paper, which must be dried at a relatively low temperature all the year round. A temperature not exceeding 57 degrees is necessary or desirable. In cases like this, no external air whatever is used except in cold weather. The air from the drying room is recirculated through the washer, in which the circulating water is cooled by refrigeration. The lowering of the temperature of the air condenses the excess moisture in it. In a recent installation this water entered the spray chamber at about 35 degrees. The air was reduced in temperature to 45 degrees, at which

temperature it contains 3.4 grains per cubic foot at saturation. The air is then reheated to approximately 59 degrees, when its percentage of humidity is 60. It is then returned to the drying room and the cycle repeated.

In connection with this last process it might be mentioned that a high degree of economy results from the fact that a back pressure of 45 lb. may be carried on the refrigerating machine, whereas 15 lb. is usually figured for ordinary refrigeration. We also have a maximum of efficiency in the transfer of heat or cold between the water and the air, because of the intimate contact between the two. When we realize the condition that usually obtains in refrigeration work, with the frost covering the pipes and cutting down the efficiency of the conducting material, the importance of the feature can be realized.

COST OF SEWERS IN A CANADIAN CITY.

In Canada it is seldom that sewer construction work is now awarded according to unit prices. A certain section is now designated and bulk tenders called for. During 1907 the City of Sydney, N.S., laid some 6,570 feet of sewer. The sections were of various lengths, and the size and depth of sewer varied. The following table gives the cost of 16 sections. Laborers were paid 17½ cents an hour and foremen were paid 40 cents an hour.

Cost per Lineal Foot.

Length in feet.	Size, ins.	Average depth, ft.	Labor.	Materials.	Total.
111.3	8	7	\$0.668	\$0.370	\$1.04
297.5	8	7.5	0.711	0.354	1.06½
271.7	8	10.9	1.224	0.394	1.62
72.0	8	10.5	1.116	0.329	1.44½
142.5	8	8.6	0.936	0.329	1.26½
250.0	6	7	0.817	0.317	1.13½
83.3	6	7.5	0.688	0.201	0.89
**568.7	8	10.8	2.169	0.690	2.86
x1350.3	15	8	1.023	0.862	1.88½
93.0	18	..	0.637	1.257	1.89½
90.9	24	6.7	1.106	1.737	2.84½
754.9	15	9.3	1.157	0.789	1.94½
831.9	12	9	1.051	0.756	1.81
390.5	8	8.2	0.939	0.474	1.41½
145.0	24	..	2.425	2.284	4.71
1219.0	20	5.6	1.860	2.420	4.28

**Clay with 50 per cent rock.

xClay with 30 per cent. rock; all other trenches in clay.

About thirty steamfitters in Toronto have organized a new union, breaking away from the Journeymen Plumbers. A charter has been obtained and new officers elected.

Faulty Chimneys and Drafts

C. E. Oldacre Outlines How Some of the Faults Can Be Remedied—Bad Construction of Chimneys the Bane of the Heating Contractor—Continued From Last Issue.

There is no form or shape of chimney that is so liable to give trouble to the man who sells stoves and ranges or does heating work, or to the user of these goods as the chimney that is wide and shallow. Especially is this the case if the long side of the chimney is exposed

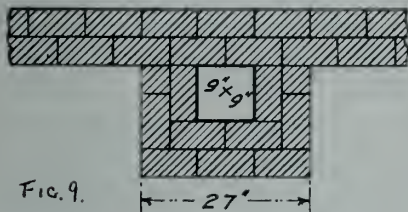


FIG. 9.

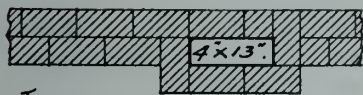


FIG. 10.

in an outside wall with only one thickness of brick work between the flue and the outside air.

There are many reasons why such a chimney may give trouble, though it may apparently have sufficient area. The outside walls may be porous, due to mortar joints that have been eaten away by the

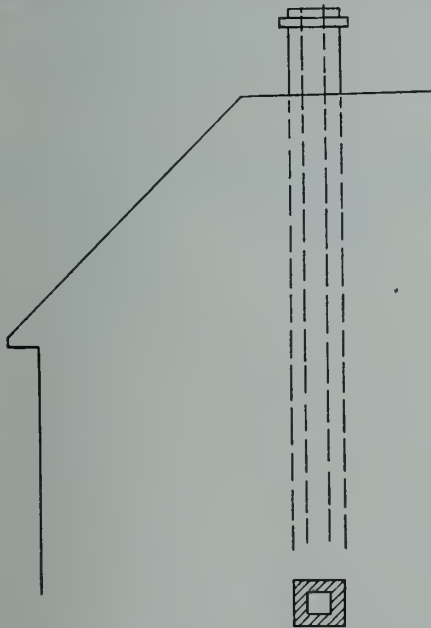


FIG. 11

ALL SIDES
WARM WALLS

weather and by the products of combustion.

When the longest dimension of the flue is presented to the outside wall surface there is then an excessive amount of cool-

ing surface that helps down the temperature of the gases in the chimney, and consequently, interferes with the draft.

The poorest shaped chimney is shown in Fig. 9, one that measures 4x12 or 4x13 inches. A much better shape is that shown in Fig. 10. One that is still more to be preferred would be a chimney having a round terra cotta or tile lining. A round chimney, one with a smooth terra cotta lining, whose diameter is equal to one of the dimensions of a square chimney, though of a less area, is to all intents and purposes just as effective as the square chimney.

A chimney in addition to having the proper shape and height must have a sufficient area to carry off the products of combustion. As has been explained in previous articles, there should not be less than one square inch of area in the chimney for each five or six square inches of grate area, and no chimney should be less than 8x8 inches, in order to give reasonable results.

Where a chimney is not of sufficient area it will do very little good to increase the height, particularly if the top of the chimney is already above all interfering roofs. Increasing the area by enlarging the chimney is the only sure remedy.

A chimney which is built entirely within the building, as shown in Fig. 11, will, as a rule, give better results than one built in an outside wall, as shown in Fig. 12, as the gases in the flue are kept at a higher temperature than is the case with the former. In addition to this, the chimney that is up through the centre or inner portion of the building is more likely to have its top so situated that it is freer and clear of all interfering wind currents.

Under similar conditions more trouble is to be found with chimneys in outside walls than those built up through the interior of the building. More difficulty from condensation, rusting out of smoke pipes, and wearing out of the interior parts of furnaces and heaters where the connection is made to chimney flues located in exterior walls than in any other case. A chimney which is damp can never draw as well as one that is dry.

There is a very good and common reason why dry interior flues give better results than exterior ones that are cold and damp. The warmer the flue, other things being equal, the better will be the draft. The hotter the gases in the chimney the lighter are the gases, and,

consequently, the more intense is the draft. The smoother the chimney on its

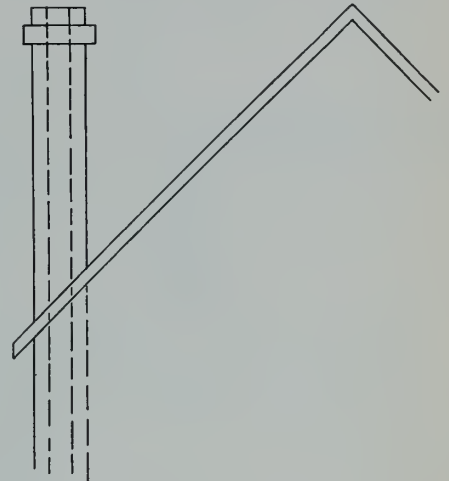


FIG. 12.

inside the less the friction that will retard the flow of the gases.

What Causes Draft.

The cause of a draft in a chimney is the difference in weight between the

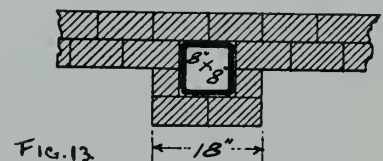


FIG. 13.

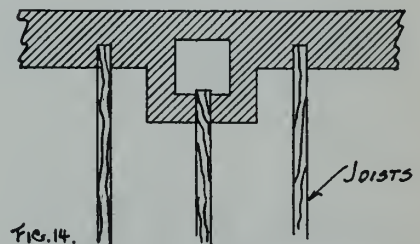


FIG. 14.

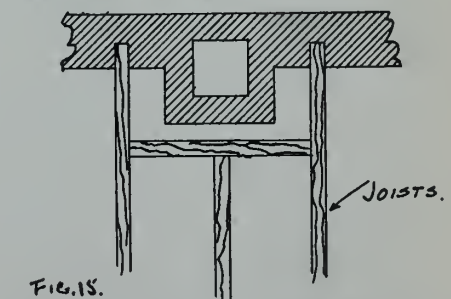


FIG. 15.

column of heated air or gases inside the chimney and a column of air of equal

height on the outside of the chimney. The hotter the gases the lighter they will be, and hence the more rapid will be the movement, or, in other words, the greater the difference in temperature be-

signable to the interior arrangement of the chimney and the connections leading from the heating or cooking apparatus to the chimney flue, and the second are due to local conditions by means of which interfering wind currents at times effect the working of the chimney. So that if this fact is thoroughly recognized the cause of the trouble is made that much easier of detection.

Causes of Trouble.

Draft troubles in general may be summarized as follows:

- Chimney too low.
- Chimney too small.

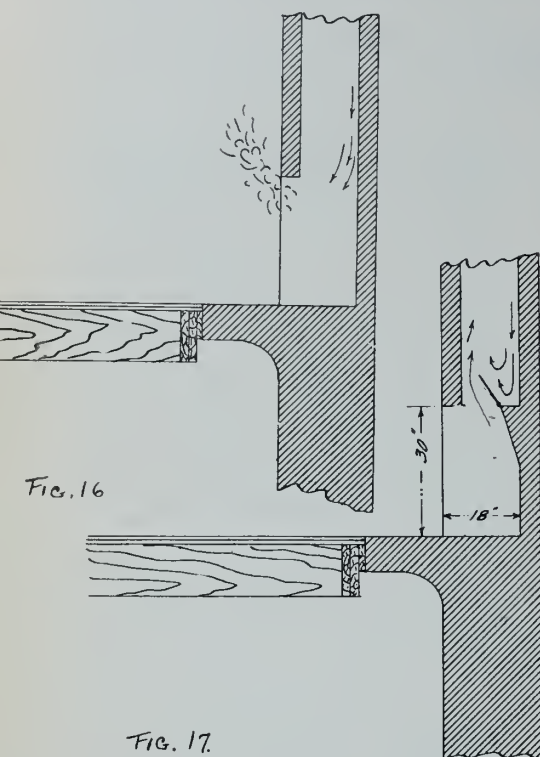


Fig. 16

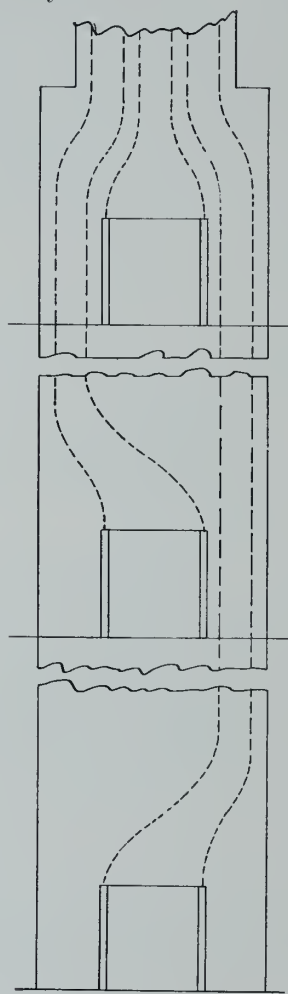


Fig. 18

tween the inside and outside of the chimney flue the greater will be the velocity of the gases moving through the flue.

More trouble, inconvenience and worry is unnecessarily occasioned the stove dealer and those engaged in the heating business from poor drafts than from any other one cause.

The chimney and its good or poor draft has more to do with the success or failure of heating and cooking apparatus than is frequently recognized.

A few of the general defects that may be found in chimneys have been pointed out in these articles, but many further variations and combinations of difficulties may be experienced than those that have here been enumerated and explained.

The modern range or heating apparatus as it leaves the manufacturer and placed on the market, can be depended on in every way as far as its fuel burning facilities (frequently termed its draft by laymen) are concerned, and where any difficulty is experienced with the draft, the cause of the trouble should be looked for further than the stove, range or heater itself. In fact, it is the last thing to blame. Stoves, ranges or heaters have no inherent quality of draft—this is a feature of the chimney.

Generally speaking, trouble with the draft or chimney can be divided into two distinct classes—continuous and intermittent. The first are generally as-

- Chimney choked with various debris.
- Chimney of improper shape.
- Chimney of improper size.
- Chimney restricted in area at one or more points.
- Chimney clogged with soot.
- Opening in chimney above smoke inlet.
- Opening in chimney below smoke inlet.
- Loose fitting clean-out doors.
- Loose fitting thimble in flue.
- Loose fitting collar around smoke pipe.
- Communication between two adjacent flues.
- Smoke pipe entering chimney too far.
- Too many twists or turns in flue.
- Chimney located too near a higher building.
- Chimney overhung by limbs of tree.

Chimney affected by wind currents directed by adjacent roofs and buildings.

Chimneys built loosely.

Chimneys not intact and loosely tied into walls.

Too many openings into the same flue.

More than one opening into a flue.

Lack of clean-out doors with soot pocket.

Chimney leaky, due to weather-beaten mortar joints.

Chimney clogged by loosened bricks.

Mortar joints of chimney eaten away by products of combustion.

Anyone of these causes, or a combination of two or more of the causes cited can and will give trouble in the working of any cooking or heating apparatus and should be looked for carefully before any trouble is assigned directly to the stove, range or furnace.

Illustrations Explained.

Fig. 9 and 13 respectively show chimneys, one of which is lined with terra cotto or tile lining, and one that is not. It is to be noticed that much less brick work is required to ensure a tight chimney when the lining is used than when the lining is not used.

Fig. 14 shows a piece of careless construction that is very likely to cause serious results. All joists as shown in Fig. 15 should be carefully trimmed around all chimneys and fireplaces.

No wood work should be allowed in direct communication with the chimney or the bottom of any open fireplace.

Fig. 16 shows a cross section of a fireplace that would be very likely to give trouble. Particularly would this be the case if it was located in an outside wall. Cold descending currents of air on the back wall would be very likely

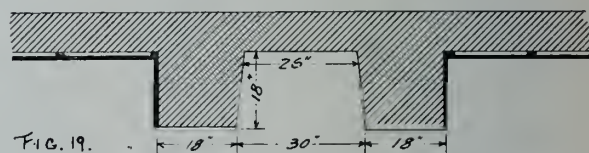


Fig. 19

to force smoke out into the room and make the fireplace a nuisance instead of a source of pleasure.

Fig. 17 shows the cross section of a fireplace that would be found free of such difficulties. It will be noticed that any descending currents of air would be deflected by the ledge at the throat of the fireplace so as to mingle with ascending heated currents from the fire below. A tight-fitting damper is also shown at the throat. This should be closed when the fireplace is not in use.

Fig. 18 shows a front view of the opening of such a fireplace, together with the arrangement of flues for three floors, and Fig. 19 shows the same fireplace in plan.

All fireplaces should be built with the ledge shown and the throat should be

pinched down so that there is not an opening more than four or five inches deep by the full width of the fireplace.

All fireplaces should have walls that incline forward as shown from a point between 1-2 and 2-3 of their height toward the throat.

House Steam Heating Systems

J. F. Bennett, in the Plumbers' Trade Journal.

The art of house heating by steam has undergone many evolutions since its primary introduction as a means of warming buildings. From the crude systems of a few generations ago, down to the present day, when the art of heating by steam has almost reached perfection, is a far cry. Some of the earlier systems are again revived, and as various conditions of buildings require different layouts of work, or piping, it may be well to look into some of those systems.

One of the earlier forms of the one-pipe system is shown in the illustration with one connection to each radiator and a main on every floor. Those mains are to be carried full size from the feed riser to the return riser the high ground being at the feed end and the low point at the return end.

This is on the assumption that the radiation is placed along the outside walls of the building. Should the building have two exposed sides, four risers are run, one at each corner, two of them being feed risers and two return risers. If the horizontal mains are reduced in size before the return riser is reached, unless eccentric tees or bunnings are used, traps will be formed, which will cause water hammer. If, however, the mains are run full size from feed riser to return riser, and pitched properly, there will be no chance to form a pocket for water of condensation, consequently better and quieter circulation will result.

It will be found to be a good idea to form a seal at end of return mains as shown at A, in preference to running straight into riser as shown on other floors. Also, it will be a good plan to have high point of feed main at the boiler pitching about one-half inch in every ten feet to the foot of the feed riser, from which a drip should be taken and run back as a wet return to the boiler, as shown by dotted lines.

The writer saw a job of approximately 1,200 square feet—a hotel, which was fitted up on those lines, and worked satisfactorily. As there was only one exposed side to the building, practically all of the radiation was on that side. Three radiators in the front were supplied from a branch riser, which was

The chimney for an open fireplace should not be less than one-tenth (1-10) of the area of opening (that is, the height multiplied by the breadth) and the minimum size should be not less than 9x12 or 9x13 inches.

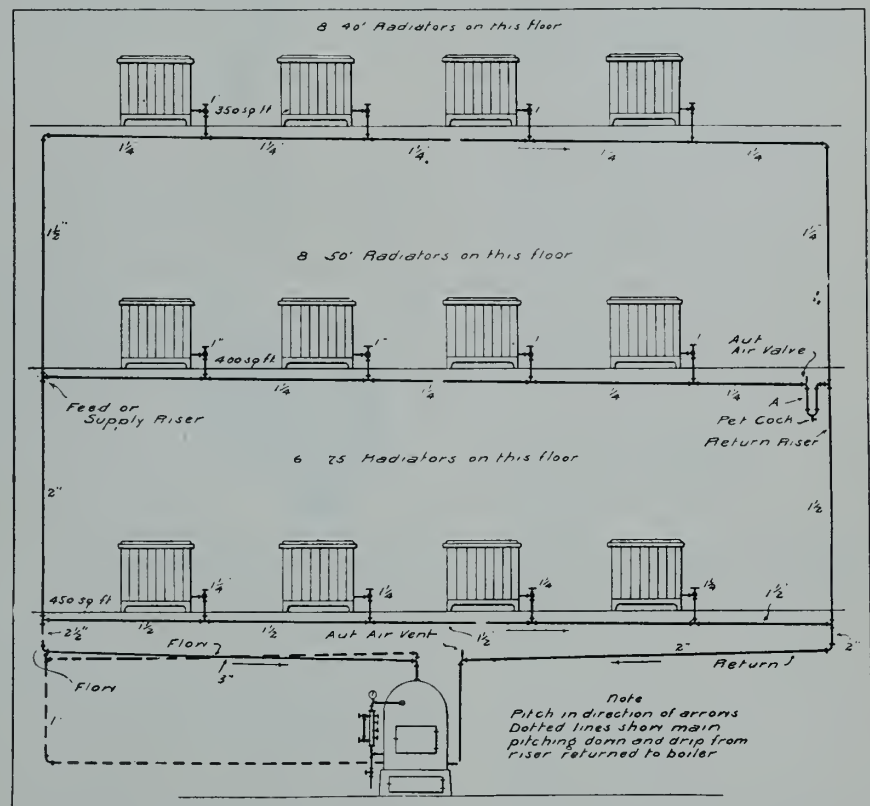
dripped into a wet return. All pipes were covered.

One Main System.

Another form of the one-pipe system which caused much profanity and excretion of the poor fitters—no irony intended—was the one main system, where in the main was reduced at several points along its circuit, before as eccentric fittings were as common as they are to-

branches taken from the side of the main and each riser dripped from the bottom, each drip being connected to a return at the boiler. It is a question where this idea originated. Old "Clipper" Flynn used to dispute with himself as to whether or not it did not originate in Nova Scotia or in Quebec. He never settled the question satisfactorily to himself.

It was, at any rate, an improvement upon its predecessors that had gone before. The next improvement was connecting the drips into a wet return, below the water line of the boiler, and connecting them into the return below the water line. Next, some sensible fitter discovered the plan of carrying the main full size until it dropped into the return, when it was reduced by means of a reducing ell. The fitters began to show good sense when they adopted the forty-five fitting for taking branches from the main, as it permitted of getting dryer steam from nearly the top of the main, and the condensation returning



Early System of one Pipe Heating with one Connection to Each Radiator.

day. The cracking and pounding due to this system, caused many a good man to sit up nights, and earnestly indulge in lurid profanity. And the knocks caused by the system, as well as the knocks it received from those afflicted with it, did not, as a rule, cause people to become enamored with steam heating of the noisy pattern. You could not blame them.

The next change was to the main in the cellar principle, with horizontal

along the bottom of the horizontal branch flowed gently down the side of the tee to the bottom of the main, and thence onward with the flow of the steam into the return.

This really marked the beginning of the noiseless one-pipe, or one-main system. Later on they discovered the utility of the air vent on the main, at the end just above the water line. This was a distinct aid to the circulation,

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

FENCE WATER PIPES.

Editor Plumber and Steamfitter: I was interested in reading in the last issue of Plumber and Steamfitter the paragraph descriptive of a fence sprinkling system used somewhere in the United States. The idea was a fence made of water pipes which could be used for sprinkling purposes. Such a fence may be seen here at the C.P.R. station, and also at the railway station at Ayr. No doubt there are other places in Ontario where such a sprinkling fence may be seen. I mention this merely to show that not all the good things are first adopted in the United States, and that Canada is not behind that country in making use of practical innovations.

London, Nov. 20. J. O. H.

HOME-MADE VACUUM CLEANER.

The installation of a vacuum cleaning system in private houses entails at present a considerable expense, as it includes the purchase and maintenance of a gasoline engine and vacuum pump. If the latter two machines were eliminated, and a simple method of obtaining the required vacuum devised, this great labor-saving device would be much more in evidence.

This object can be realized by use of the ejector or ordinary barometric condenser used in connection with the city water supply or from a tank.

The entire arrangement can be built at the rear of the dwelling, and does not take up more room than an ordinary leader pipe.

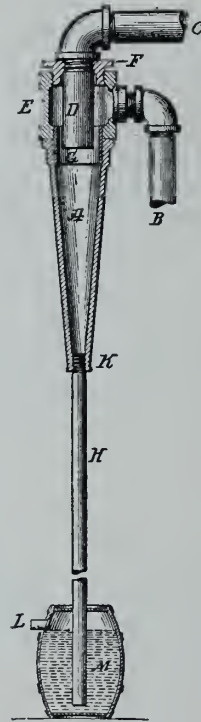
The illustration shows the arrangement of the device. A is an ordinary hose nozzle 12 inches long, with thread for 3-inch iron pipe on large end and tapped for 1/2-inch pipe on smaller end.

By means of the nipple G it is connected to a 3 x 3/4-inch tee, which is bushed on the opposite end to 1 inch. This bushing has a 1-inch pipe D extending from the inside and ending as shown in the cut just inside of nozzle. The other end of D protrudes through the bushing F, and is then run as afterward described. The smaller end of the nozzle carries a 1/2-inch pipe H, which forms the down leg of the ejector. The apparatus is placed so that the point K is at least 34 feet above the cellar, forming the barometric column. The pipe B is connected with the water supply, with a conveniently situated valve to regulate the flow.

The pipe H is carried down to a seal pot H situated in the cellar. This can

be made of a barrel with an overflow to sewer, as shown at L.

The pipe C is carried to a vacuum reservoir, which can be situated either in cellar or attic, preferably the latter, as it means a saving in piping and less joints to provide chance of leaks. This pipe is connected to top of reservoir, and the service pipe to the various rooms also



Home-made Vacuum Cleaner.

comes from the upper end, but extends to within 12 inches of the bottom.

The service pipe has a connection for rubber hose, with valve at each floor.

In order to obtain the required vacuum, all that is necessary is to turn on the water in the pipe B, when the descending column in H causes a partial vacuum in the reservoir and in the service pipes.

Care must be taken that all joints are made perfectly air-tight in service pipes and in C.

The reservoir must also be air-tight. It can be made of a kitchen boiler with a small hand-hole cut in the bottom to remove dust which collects within.

The ejector can be placed outside without danger of freezing if precaution is taken to break the vacuum when through using, thereby emptying the down leg of all water.

The down leg need not be straight if the first bend is at least 10 feet from the nozzle.

This device is not intended to supply a vacuum cleaning system for large buildings, but rather for private dwellings, and can be put up by anyone accustomed to handling pipe and competent to make good tight joints.

W. J. C.

INSPECTOR WANTS TO HELP.

Editor Plumber and Steamfitter: I have read with much interest your editorial, "Ontario Plumbers Should Organize," and Mr. Cooper's "Letter to Ontario Plumbers," and it appears to me you will be making the plumbing fraternity your lasting debaters, if you can accomplish only a small part of what the term means.

I spent Nov. 9 in Toronto, and, walking through what is, or was, the Queen's Park, noticed many educational institutions gathered together in one section. Why? Because the best educators of the country recognize the great advantage there is in organization or co-operation.

Referring to your editorial, let me ask a question or two:

Where is the city, or its name, whose aldermen having the disposal of sewage under consideration, would deign to let a master plumber, or a plumbing inspector, sit in the same room with them, let alone advise on such matters?

Where is the Board of Health that will allow master plumbers or inspectors to be present at their meetings for the purpose of advising them?

Where is the medical health officer or M.D. who will admit that it would be for the best interests of the community that plumbers or inspectors should be their allies?

When a town or city council determines to adopt a plumbing code or by-laws, is it not the invariable custom to send all over to other places and get copies of their by-laws, and then sit down and copy what they think fit, or what strikes their fancy, out of the whole lot, regardless of the age or adaptability of said copies? And nine times out of ten the men selected to compile said by-laws do not know which part of the trap connects with the sewer, or which to the fixture.

Please remember there is not a particle of sarcasm intended in the above.

Mr. Cooper is on the right track, and when the master plumbers begin to meet, I, for one, would like to attend, if allowed, not to advise, but to co-operate. Master plumbers look on plumbing inspectors too often as detectives or spys, ready to pounce on everyone at every opportunity. This is not so, and one of the best methods of dispelling like notions would be by meeting in conventions.

R. H. MYERS,
Plumbing Inspector.

Stratford, Nov. 14.

Live Advertising by Western Plumbers

Some enterprising advertising is being done by plumbing firms in Western Canada as is evidenced by the samples of ads reproduced in this issue from two Saskatoon papers.

The Western Plumbing & Heating Co., Saskatoon, in the Saskatoon Phoenix of Oct. 21, had a half-page advertisement which was well put together and displayed to good advantage by the printer. The list of references for whom work has been done is, of course, the chief point, but the whole ad is strong and should pay for itself again and again.

In the Saskatoon Capital of Oct. 31, Elford & Cornish took a whole page, devoting the bulk of their space, however, to talking warm air furnaces. This half of the ad has been eliminated and the top and bottom portions only are shown in the illustration. The ad is argumentative and suggestive, pointing out reasons why the heating systems the firm installs are certain to give satisfaction, and coming back at the bottom with the announcement of a profit making novelty—a water filter to prevent disease. Local reasons may make necessary the slap at the opposition firms who may do work cheaper, but it is pretty certain that the ad would be stronger if it was 100 per cent. boost and 0 per cent. knock. With this slight criticism the ad must be commended as one of the best heating an-

address card announcement is John Colbert, Victoria, B.C. Under the heading "Modern Plumbing," and a large two-column wide view of a bath room, Mr.

Plumbers, as a rule, are not progressive advertisers, and to aid in learning the most productive announcements readers are requested to forward to the editor of The Plumber and Steamfitter samples of their advertisements in local papers.

Western Plumbing and Heating Co.

We Keep People Warm who Recognize Good Work When it is Done

Here are some References,
The Best in the City

PLUMBING AND HEATING
Empire Block
Hanson Block
Bank of Commerce
Sutherland Block
Gordon & Searling B.
Brewery—All steam pipes fitted & repaired
Residence—Plumbing & Heating
Saskatoon Court House—Plumbing & Heating
Ballfield Court House—Plumbing & Heating
New City Fire Hall—Plumbing & Heating
Saskatoon Nursery—Hot Water Heating
Joe Wilson's Residence—Plumbing & Heating
Jas. Willemsen's Residence—Plumbing & Heating
Sheriff Calder's Residence—Hot Water Heating
J. F. Cairns—Steam Heating
Mrs. Copeland's Residence—Hot Water Heating & Plumbing
J. W. Alcock's Residence—Hot Water Heating & Plumbing
J. A. Adams' Residence—Plumbing & Heating

PLUMBING
Western Hotel
King Edward Hotel
Great West Furniture Co.
King Edward Bath Rooms
B.C. Restaurant
Alexandra Residence
Hewes Residence
Mr. Bulmer's Residence
Mr. Sampson's Residence
Dr. Young's Residence
W. J. Bell's Residence
B. Chubb's Residence
Mitten Brothers' Residence

We Handle Safford or Daisy Boilers

Which Can Be Added To Without Discarding One Piece
of Old Boiler—a great advantage, indeed

A glance at our references will convince all that we are doing the Heating and Plumbing in the best buildings in this city. The Safford System of Heating is recognized as one of the best—if not THE best—systems in use. Its strong recommendation is its great efficiency and still greater economy.

Every building in which we have installed the heating is giving the best of satisfaction, and our numerous orders go to prove that the public know where to get the best at the most reasonable charges.

Keep Warm This Winter by Installing a Safford or a Daisy. Get the Best for Your Money

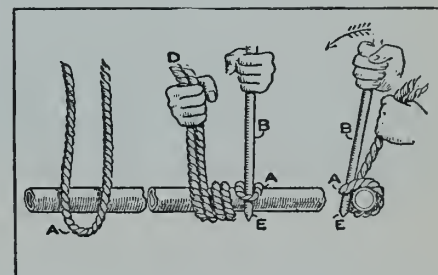
Western Plumbing & Heating Co., Avenue B and 20th Street

Advertisement in Saskatoon Phoenix, October 21, 1908.

Colbert argues: "To safeguard the domestic health and to keep the home thoroughly clean and wholesome at all times, modern plumbing, installed with care, is

TURNING PIPE WITHOUT WRENCH.

A piece of rope makes a good substitute for a pipe wrench if used as shown in the accompanying sketch. Double the rope and form a loop, A, in the middle and wind it around the pipe a couple of turns, pass a bar or piece of pipe, B, through the loop with its end, E, against the pipe as shown.



Will Not Crush the Pipe

Hold the end, D, of the rope taut and push the handle end of the bar in the direction as shown by the arrow. This will tighten the rope and make it grip the pipe which will turn in the direction the bar is pushed. Slack up on the bar and rope and bring them back again to the first position for another grip. Repeat the operation until the pipe is turned out or in. This device will turn a pipe as well as a pipe wrench and will not crush the pipe.—Popular Mechanics.

Wood is now seasoned by electricity. The sap is driven out by a strong current and its place is taken by a solution of borax and resin.

HEATING THE HOME

AND PLACE OF BUSINESS IS A GREAT PROBLEM IN THIS NORTHERN COUNTRY

We Solve That Problem For You

THAT OUR METHODS, Workmanship and the Systems we install are the best may be readily learned by asking any of the many satisfied customers for whom we have installed Heating Systems. Below, in this ad, we give a list of some of these for whom we have put in Heating Systems.

You will want to save coal this winter if you ever will. . . How much coal do you suppose you waste in your old furnace? . . . Consider how much heat goes up the chimney; how little control you really have of the fire; how much good coal is thrown out with the ashes.

We have been successful in solving all these problems, because we install the most modern coal-saving, heat-giving systems, and the fact that each little detail of our work has our personal supervision means much in itself.

Following are some for whom we have worked. Ask them.

The following have had the **OXFORD FURNACES** installed in their homes:
H. E. BURNETT—Hot water heating system, plumbing, bath, heat, and water, and range, hot and cold water, hot water heating system.
J. J. WITFIELD—Hot water heating system.
FARMER FARMER—In better shop, hot water heating system, plumbing, three baths and W.C.
We are getting as **Dr. J. W. Smith** the house of **MR. CHAS. SMITH**. The Contract for the Plumbing in the Summerfield Block, Victoria, has been given to us.

YOU NEED NOT FEAR FEVER FROM THE WATER IF YOU ATTEMPT ONE OF OUR HYGIENIC WATER FILTERS TO THE WATER TAP. Fit any style of tap. Others may offer to do you plumbing or put in furnace 25 per cent. cheaper than we do—but their filters do not use good material or else they skip the work in some way. Our work is done at the almost margin of profit and is done RIGHT. WE GUARANTEE OUR WORK.

ELFORD & CORNISH

PLUMBERS AND STEAM FITTERS.

THE MEN WHO PUT IN THESE CELEBRATED HEATING SYSTEMS

First Ave.
PHONE 126

Advertisement in Saskatoon Capital, October 31, 1908.

nouncements ever made in a Canadian paper.

Another Western plumber who gets away from the stereotyped name and

essential. We employ only skilled mechanics and guarantee every installation. Will be pleased to show fixtures and give estimates."

NEWS OF THE TRADE IN CANADA

George A. Wooten & Co., plumbers, Halifax, have moved into their new store building.

The Western Heating & Plumbing Co. have been awarded the contract for heating the new fire hall at Saskatoon.

Lewis Legrow, master plumber, Toronto, has secured a permit for the erection of a pair of brick dwellings to cost \$4,000.

H. Elford, of the Plumbing firm of Elford & Cornish, Saskatoon, has an interest in the new skating rink of that town.

G. & E. Blake, St. John, N.B., have completed the plumbing and heating contract for the new Y.M.C.A. building, St. John.

Bernhardt & Gies, Preston, have been awarded the contract for the installation of a heating system in the new Carnegie library at Harriston.

Jas. H. Doody, St. John, has been awarded the contract for the heating and plumbing of the new Winter Street school, in that city.

W. J. Graham, Montreal, has been awarded the contract for the plumbing of the new Presbyterian church in course of erection at Maisonneuve.

The firm of Kavanagh & Sanderson, plumbers, Montreal, has been registered.

The firm of Bedard & Le Page, plumbers, Montreal, has been registered.

Adam Taylor, secretary of the Taylor Forbes Co., has been re-elected vice-president for Guelph of the Canadian Commercial Travelers' Association.

The circular sent to the vice-presidents from the secretary of the National Association of Master Plumbers, pushing on the work of organization, has been favorably commented on, many replies having been received expressing approval of the step.

Richard Rushton, a plumber of Kamloops, B.C., had a narrow escape recently. He was carrying a 22 calibre rifle, when, in jumping from a buggy, the weapon discharged and the bullet passed through his left lung.

W. Grant, master plumber, Sudbury, and W. Linton, Toronto, salesman for the Standard Ideal Manufacturing Company, Port Hope, had some good sport together hunting deer near Sudbury a fortnight ago.

Recently the natural gas supply was turned on for trial purposes in Blenheim, the inaugural illumination being witnessed by a large crowd. The natural gas company and the various Blenheim gasfitters are busy installing services.

McVean & Craig, Prince Albert, Sask., have been awarded the contract for the construction of the extensions of the

sewers and waterworks systems to the new city hospital and Alexandra school at Saskatoon.

Barr & Anderson, of Vancouver, were successful in securing the job of installing a sprinkling system in the wholesale hardware house of McLennan, McFeely & Co., in that city, the price being about \$10,000. The principal competitor was the Pacific Coast Fire Extinguishing Co., Seattle.

Residents on Markham Street, Toronto, are objecting to the location of a plumbing shop in what they term a purely residential district. A plumber has hung out a brass sign and intends erecting a workshop in his back yard. Chinese laundries and stores have been excluded in the past, but this is the first time a plumber has been objected to. The case is to be decided next week.

Captain Thomas Douglas, a prominent figure in the commercial life of Halifax, died suddenly in New York on Sunday morning last. He was the business manager of the wholesale plumbing and hardware firm of Stairs, Son & Morrow, which firm he had been identified with for several years. He visited New York and while there he contracted pneumonia and he failed to rally from the attack.

A footbridge attachment is under construction over the traffic-bridge, in Saskatoon. Under the footbridge a water main is being laid to connect the powerhouse with the water tower on Nutana hill. Temporary pipes laid across the main bridge froze solid and burst. A rather unique scheme is under way for keeping the permanent main from freezing during the winter months. The pipes all the length of the bridge, some 950 feet, will be wrapped in hair insulator and then covered with vitribestic lagging containing air cells. This will then be encased in a wooden jacket or box in which will be placed a number of electric car heaters which will be connected up and heat turned on when the thermometer drops below the zero point. The pipes have been successfully connected up and the wrapping process is now in progress.

NEW GODERICH FIRM.

The Goderich Signal, in a recent issue, said: The firm of Pinder & Paulin, who are engaged in the business of plumbers and general jobbers, is practically a new firm, having entered into partnership some six months ago. Mr. Pinder carried on the plumbing and tin-smithing business for some years in the present stand previous to entering into partnership with Mr. Paulin, who conducted the hardware business now carried on by the Howell Hardware Co. Both Mr. Pinder

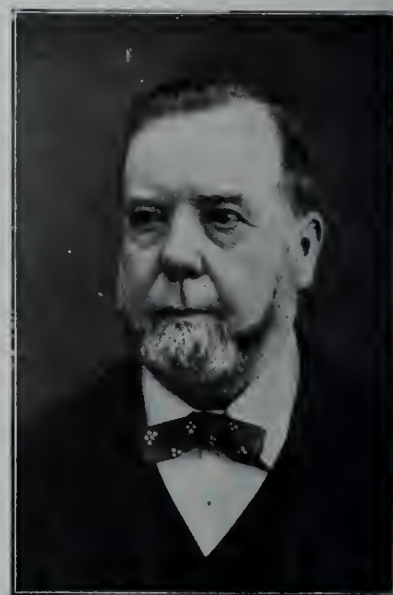
and his partner are practical men and bear a high reputation for first-class work. The firm carries a full line of stoves, ranges, furnaces, tin and granite-ware, also electric fixtures. They also make a specialty of electric wiring.

West Toronto is to establish a public comfort station in the fire hall building with a separate entrance.

R. Sturgeon, Peterboro, was a visitor in Toronto last week. He reports having completed a semi-district steam-heating system at the Stevens-Hepner brush factory at Port Elgin. Connections are made to several nearby houses.

FIFTY YEARS A TRAVELER.

General regret has been expressed in hardware and plumbing circles at the recent death from typhoid fever and other complications, as announced in



THE LATE WM. GREIG, MONTREAL,
For Nearly Half a Century a Plumbing
Supply Salesman.

Hardware and Metal last week, of the veteran traveler, William Greig.

Mr. Greig was for nearly half a century in the service of the James Robertson Co., Montreal, and with but one exception, appears to have held the record for continuous service with the same firm. His loss to the James Robertson Co. can thus be understood.

The fact that a man has been in the continuous employment of a firm for nearly half a century says much for that man. He must possess qualities of the highest order. This was true of Mr. Greig. His business career was marked by honest, straightforward dealings, which gained him the confidence and respect of the business community, and in fact, of all those, in public and private life, who came in contact with him.

Mr. Greig was a native of Montreal. His business career was commenced in

1857, when he entered the employ of James Walker & Co. In 1860 he became connected with the Canada Lead Pipe Works Company, now the James Robertson Company, and made no other change. Between 1884 and 1891 he represented his company at St. John, N. B., and looked after their interest in the Maritime Provinces. On his return he represented the company in Quebec, and Eastern Ontario. Mr. Greig was a member of the Oddfellows, and of the Ancient Order of United Workmen.

A letter of condolence was sent to Mrs. William Greig by the National Association of Plumbers.

GUELPH FIRM'S GOOD DISPLAY.

At the recent fall exhibition at Guelph many local firms made exhibits, including Stevenson & Malcolm, master plumbers. The illustration shows that some

plumbing by-laws and are also planning some open meetings for early in the new year.

Mr. Cooper, as vice-president for Ontario in the National Association, has received many letters from good men in the trade in other cities and towns, endorsing the proposal that a provincial association be formed next spring.

Prospects generally look brighter both in Toronto and in Ontario.

COMING CONVENTIONS.

On Jan. 19, 20 and 21, 1909, the fifteenth annual meeting of the American Society of Heating and Ventilating Engineers will be held at the Engineering Societies' Building, 29 West 39th Street, New York. A large number of interesting papers is already promised and many members have signified their intention of being present.

Secretary C. S. McCosker, of the

ROOSEVELT AND THE PLUMBER.

President Roosevelt can enjoy a joke turned against himself. Once, while visiting his sister, Mr. Roosevelt entered the room after everyone else was at the luncheon table. He was laughing heartily.

"I have just played a mad prank on the plumber," he declared. Then he related how he had gone to the bath room to wash his hands, when he heard what seemed to be stealthy footsteps coming down the hall. The boys had played a number of jokes on him, and he immediately surmised that they were about to spring a new one. He sopped a wash-rag in water; then, with the dripping cloth in his hand, he waited the attack. The steps came nearer and nearer, then stopped, and someone tried to open the door, which the President was holding shut. Suddenly he threw the door wide open, simultaneously swinging the wet



Display made by Stevenson & Malcolm Co. at the Recent Fall Fair at Guelph.

trouble was gone to in preparing an attractive display, and Mr. Malcolm states that results justified the effort, as many inquiries received have been followed up successfully for business.

One advantage of making exhibits at fairs is that it brings the firm before the well-to-do farmers who have the price to pay for modern plumbing and heating systems in their country houses.

BUSY AT ORGANIZATION WORK.

George H. Cooper, Secretary of the Toronto M.P.A., reports that the local association has made a substantial gain in membership during the past month as a result of the work of organizer Andy Mann. The Ways and Means Committee is busy on a revision of the

American Society of Inspectors of Plumbing and Sanitary Engineers, has issued from his office in Mobile, Ala., a list of the officers, committees and the membership of the association which should be very useful to the members, and the society is to be congratulated on the enlargement noticed over the previous membership list. The meeting of the society in Omaha next February is expected to be the largest yet held. Any member who has a subject in mind should inform H. J. Luff, of Cleveland, of it, and have the completed paper in his hands early in January, so that copies can be read for the meeting. Canadian plumbing inspectors should join the society and attend the convention.

cloth over his head and snorting gleefully, "I've got you now!" The wash-rag landed, not on the head of one of the boys, as he had anticipated, but square across the face of a startled plumber who had come to repair a defective pipe. It is hard to say who was more surprised, the President or the plumber. Mr. Roosevelt apologized profusely, explained the circumstances, and then descended to the dining-room, shaking with laughter.

To wiggle your gray matter and think thoughts is one thing; to wiggle physically and execute them is quite another thing.

CONTRACTS AND BUSINESS OPPORTUNITIES

Public Buildings.

A new drill hall will be erected in Lethbridge, Alta.

Shelburne, Ont., is agitating for a new G.T.R. station.

A new post office is being erected in Listowel to cost \$20,000.

The Government has bought a \$5,000 post office site in Souris, Man.

Fernie, B.C., is erecting a new school to cost \$29,000 and city offices \$30,000.

St. Barnabas Church, Victoria, is considering the erection of a new house of worship.

The British Columbia Anti-Tuberculosis Society is erecting a sanitarium in Victoria.

London will submit a by-law for the erection of a hospital for tuberculosis patients.

A four-storey building for the Deaconesses' Home will be built in Toronto, to cost \$100,000. The permit has been issued.

The work on the new Chebucto school building, Halifax, will be proceeded with at once.

The newly organized Mounted Rifles of Kamloops, B.C., will have a new armory building.

The contract for a frame school at Sutherland, Assa., has been let by the Nutana School Board to F. H. Webb, for \$1,794.

St. Mary's (Ont.) Council will be asked to submit a by-law to the ratepayers for a new Public School, the cost of which would be \$35,000.

The Parks Committee, Toronto, have accepted the plans for the new palm house for Allan Gardens and have forwarded to the Board of Control a recommendation that \$30,000 be provided for the erection of the structure.

The Grand Jury at Guelph condemned the G.T.R. station as a nuisance. The city has offered a free park, but want several subways. These the G.T.R. ask assistance in building. In the meantime an agitation for a new station goes on.

Municipal Undertakings.

Meaford is discussing the need of increased water supply for fire protection.

Victoria has agreed to supply city water to Oak Bay, a neighboring municipality.

The Pintsch Gas Co., of New York, have completed arrangements to establish a plant in North Bay.

North Vancouver will have a new service reservoir in connection with its proposed waterworks extension.

The last of the trunk sewers in London has been completed, \$50,000 having been spent in the trunk system.

The water rates of Winnipeg have been decreased by twenty-five per cent. in ordinary rates and a further increase to large consumers.

Peterboro Water Commissioners have recommended the construction of a new concrete dam and pumping station and will have plans prepared at once.

Vernon, B.C., has awarded the contract for pipes for its sewerage system and has decided to buy three and a half acres of land for sewage disposal works.

It is probable that Montreal will buy out the plant of the Montreal Water and Power Company, and that legislation will likely be asked for that purpose.

The new waterworks system at St. Mary's, N.B., is running smoothly. The system cost \$20,000 and includes a large reservoir with a capacity of 200,000 gallons.

The International Heating and Lighting Co., of Cleveland, will instal a gas system in Portage la Prairie in 1909, and an extension of the time of the franchise is being asked.

Haileybury will go ahead with a sewerage system, \$20,000 bonds bearing 5 per cent. interest and repayable in 30 years having been disposed of to private citizens.

The waterworks mains in Ottawa will likely be extended to Rockcliffe. A recent analysis of Ottawa water shows that it is the third purest of any supply in Canada.

The Sewers Committee of Hamilton has awarded the contract of installing a sewer system on the mountain to Geo. F. Webb, at \$26,140. The City Engineer's estimate of the cost being \$35,863.

Many deputations have visited Lindsay recently to inspect the installation of the ozone system of water purification which is giving that town the benefit of much publicity of the right character.

In the arbitration as to the value of the Ottawa East waterworks plant, that municipality having been taken in the Ottawa city corporation limits, the arbitrators fixed the value at \$70,000. The city offered \$55,000 at the time of annexation.

London has been offered gas at 30 cents per thousand, piped from Romney Fields, and the company announces that it will be ready for business at the first of the year. The City Gas Co., London, has intimated that it will be willing to distribute natural gas. The city franchise has not yet been awarded.

A Brantford Power Committee has declared in favor of a civic plant and seeking admission to the ranks of the Western Ontario Power Union. The committee reported that it could thereby save one-third of the cost of street lighting.

Gravenhurst is considering the question of waterworks and it is proposed to give a private company the right to lay the mains and instal a pumping station, the town reserving the privilege to take over the works at any time when a municipal system is feasible.

At the sixtieth annual meeting of the Consumers' Gas Company, Toronto, it was announced by General Manager W. H. Pearson that the cost of producing gas in Toronto is less than in any American city. The company last year had 23½ miles of new mains laid, 4,941 new services installed.

General Building Notes.

All Saints' Church, Toronto, will build a parish house.

W. W. Lyons is erecting a block of stores in Edmonton.

E. G. Patterson, Peterboro, is erecting a residence to cost \$7,000.

The Carnegie Milling Co. are erecting a new saw mill at Port Perry.

C. Jobin, Quebec, is erecting a three-storey residence, to cost \$8,500.

W. J. Boyd is erecting a theatre building in Winnipeg to cost \$10,000.

Stratheona Curling Club, Winnipeg, will erect a rink to cost \$3,500.

The new Provincial Government building in Fernie, B.C., will cost \$80,000.

Charles F. Lavender will erect a three-storey hotel building at Norway, Ont.

Alsip & Patterson are erecting a \$40,000 apartment block in Winnipeg.

J. G. Scott will erect a brick and concrete store in Vancouver, to cost \$40,000.

St. James' Cathedral, Toronto, will erect a new parish house to cost \$60,000.

St. Mary's, Ont., Curling Club is contemplating the erection of a new rink.

J. Bulger, Toronto, will erect two semi-detached brick dwellings to cost \$7,600.

W. W. Stuart will build a frame apartment house in Vancouver to cost \$18,000.

J. Curry, Toronto, is having plans prepared for an eighteen-suit apartment building.

The building permits granted in Fort William so far this year amount to \$1,525,060.

The Thunder Bay Elevator Co. will erect an elevator in Port Arthur to cost \$500,000.

The new Deaconess Home, Toronto, will cost \$125,000. The permit has been taken out.

A. B. Williams will build a brick and concrete business block in Vancouver, to cost \$35,000.

A new opera house will be built in Lethbridge by S. Griffiths, of Sweet Grass, Montana.

Fernie is being rapidly rebuilt. One thousand five hundred men are employed in new structures.

A new business block will be built on Hastings St., Vancouver, three storeys high, to cost \$20,000.

A. Herbert is erecting a business and office block in Edmonton to cost \$20,000.

A \$150,000 modern fireproof hotel, seven storeys high, will be erected in Vancouver. It will be of pressed brick, stone and structural steel. Parr & Fee, Vancouver, are the architects.

Cobalt's first brick building has just been completed. It is the property of Dr. T. C. McLaren and R. D. Devlin. It consists of three storeys and a basement.

A three-storey brick addition is being erected at the Broadway School, Toronto, to cost \$9,285. A three-storey addition to the Morse St. school will cost \$17,196.

In building permits for October, out of fifty-one leading cities in America, Toronto stands seventh. The increase in the corresponding month for last year was 31 per cent. and the permits represented a value of \$1,019,492.

Recent building permits issued in Toronto include: E. T. Burgess, pair dwellings, \$3,000; Mr. Conder, dwelling, \$4,000; Wm. Dalton, store, \$3,000; Albert Dales, dwellings, \$4,500; D. C. Smith, dwelling, \$4,000; Thos. R. Haig, office and dwelling, \$3,200; W. J. Little, dwelling, \$3,500; Mrs. T. G. Brough, dwelling, \$12,000; W. Avison, dwelling, \$3,500; Theodore Price, dwellings, \$4,000.

Toronto building permits of the past few days include: John Bulger, pair brick dwellings, \$5,600; Mitchell & Bennett, brick dwelling, \$4,000; Stackwell & Henderson, 3-storey brick store and dye-house, \$20,000; M. A. Hunter, pair brick stores and dwellings, \$7,000; C. Coulter, 2 pair brick dwellings, \$9,000; F. Tobey, pair brick dwellings, \$5,000; A. McLean, brick store, \$5,750; E. J. W. Devitt, 3 pair brick dwellings, \$15,000; C. E. Porter, brick dwelling, \$9,000; D. H. Atkinson, \$4,000; D. C. Edwards, brick dwelling, \$5,000; J. Kyle, 2 brick dwellings, \$6,000; G. F. Barley, \$5,600; S. C. Smith, brick dwelling, \$8,000; E. G. Rennie, 2 pair brick dwellings, \$9,000; C. C. Mitchell, pair brick dwellings, \$8,000; G. Phillips, brick

store and dwelling, \$15,000; Lakeview Curling Club, brick rink, \$6,000; G. Brady & Son, pair brick dwellings, \$6,000.

Recent building permits in Toronto include the following: P. Gillilan, brick dwelling, \$5,500; E. G. Switzer, one pair brick dwellings, \$5,000; McWhinney & Hopper, four pair brick dwellings, \$16,000; D. B. Bowerman, brick and stone dwelling, \$6,500; A. A. Beemer, brick dwelling, \$4,500; A. C. Mably, brick dwelling, \$4,000; B. H. Fraser, two rows of six roughcast dwellings, \$15,000; R. S. Galbraith, brick dwelling, \$4,500; R. S. Henderson brick dwelling, \$3,200; Agnew Bros., one pair brick dwellings, \$6,000; R. Robson one pair brick and stone dwellings \$5,000; J. Crang, one pair brick dwellings, \$5,000; E. H. Hareourt & Co., brick addition to factory, \$3,000; L. Legrow, pair brick dwellings, \$4,000; J. W. Walker, brick dwelling, \$4,000; J. H. Harvey and John Pherril, two pair brick dwellings, \$10,800; W. A. Wilson, pair brick dwellings, \$4,250; W. H. Martin, brick store and dwelling, \$4,000; G. Griffith, three brick dwellings, \$9,300; J. Delworth pair brick dwellings, \$4,400; H. S. Mara, pair brick dwellings, \$5,000; A. Nelson, three brick dwellings, \$6,300; C. W. Chadwick, two pair brick dwellings, \$7,200; M. Courtemanche, three attached two-storey brick dwellings \$6,000; W. Fountain, brick stable and carriage house, \$3,500. Duth & Sons, pair brick dwellings, \$6,000.

RESIDENTIAL HUMIDIFICATION.

Many people wonder how it is that as soon as it becomes necessary to commence the heating of our residences in the fall of the year, and during the months fires are lighted, how prevalent sickness becomes, and they are at a loss to understand the cause thereof.

Those suffering from catarrhal troubles find it almost impossible to obtain relief, entire families are laid up with colds, sore throat and other troubles which are generally ascribed to the changeable weather, whereas in nearly all cases such sickness has been brought about by the lack of natural humidity in the atmosphere.

To overcome this difficulty a large number of people place on top of the stove, furnace and also on the radiators of steam and hot water heated buildings, small pans filled with water, the vapor arising therefrom assisting materially to humidify its immediate surroundings, but such methods are an eye-sore; entirely so that in regard to the latter

the problem was until recently a long way from solution.

It is well known that the normal summer humidity of the atmosphere is from 85 to 90 per cent, but in winter when artificial heating of our homes takes place, unless some means are taken to counteract it, the natural humidity is almost entirely destroyed and in consequence we are compelled to live under almost unnatural conditions during the whole of the winter, therefore, it is no wonder that we suffer in the manner above described. Again it is a well-known fact that with a humidified atmosphere more comfort can be obtained from our various heating systems, as a temperature of 60 degrees with about 60 per cent. humidification is far healthier and comfortable than a 75-degree temperature without.

A short time ago, however, our attention was drawn to an apparatus which is now exciting a great deal of interest among members of the medical profession, architects and sanitary engineers in Montreal. This apparatus has been placed on the market under the name of "The Hyge-Donor Humidifier," and from reports which have come to hand regarding it, is satisfactorily doing the work for which it is intended, the humidification of the atmosphere of our homes. It is claimed by the inventors that it will not only thoroughly humidify buildings in which it is installed, but also protect the furniture, ornamental woodwork, pictures, books, etc., from the disastrous effects of the moistureless atmosphere caused by artificial heating. Another claim made, and this should be welcome news to the ladies, is that flowers can be made to bloom equally as well during the winter months as during the summer.

The Hyge-Donor Humidifier has also a number of other good claims to be recognized on its merits; it is noiseless in operation, saves fuel, is entirely safe and requires no attention other than an occasional adjustment of the water supply to regulate the degree of humidity required.

Installations can be made at any time, summer or winter, the operation of the furnace not being interfered with in any way, so that it is unnecessary even to lower the fire for the purpose of connecting the apparatus.

There should certainly be a great demand for the Hyge-Donor Humidifier. Further particulars in regard to its operation can be readily obtained from the selling agent, W. J. Wall, 83 Bleury Street, Montreal.

The contract for installing a steam heating plant in the Powell House, Parkhill, has been awarded to Jackson & Yorke.

PLUMBING AND HEATING MARKETS

MONTREAL.

November 28.—A steady volume of business is being done. There is a firming tendency noticeable in many lines—in fact, lead and some brass goods have actually advanced—and this is no doubt stimulating buying. Manufacturers are not anxious to accept large orders for delivery very far ahead at present prices, which shows which way the wind is blowing. There seems a strong likelihood of prices being advanced all the way round before very long, and plumbers would do well to watch the markets carefully, and buy with judgment.

Building is still active, the open weather enabling foundation work to be carried on uninterruptedly. Plumbers, therefore, have not only been steadily engaged on work that has matured during the latter part of the fall, but have the prospects of employment well into the new year. Jobbing work is good, many shops devoting all their time to this class of business, being fully engaged. Orders are not evenly distributed, some men having more than they can do, and others the reverse, but, taking things all in all, however, plumbers in the city and district are not complaining as to conditions.

Soil pipe is moving in steady bulk, and the advance in lead pipe has stimulated orders in this line. Radiators and boilers are in good call, and the season is showing better returns than at one time was thought possible.

IRON PIPE—A steady volume of business is going through, orders, if not individually heavy, coming in freely. There is no change in prices, and we quote $\frac{1}{2}$ -in. black, \$2.63; galvanized, \$3.48; 1-in. black, \$5.11; galvanized, \$6.76. Malleable and cast iron fittings are in fair demand at unchanged prices.

SOIL PIPE—With so much foundation work still going on, soil pipe is moving out freely. Supplies are in good shape with the market very firm. We continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Lead pipe has followed solder, and has been advanced. Little stock appears to be accumulating, as most of the pipe ordered is being used at once. The advance in price has quickened the movement of the line, and prospects look extremely bright. We now quote pipe and waste at 27½ off. Traps and bends continue at 50. Caulking lead is now 5c per pound.

SOLDER—The recent advance in solder has stimulated buying. Roofers have been purchasing freely. We quote 19½c for half-and-half, and 18½c for wiping.

ENAMELWARE—A very busy time is reported by the jobbers, and manufacturers in consequence are working at

full pressure. Stocks being light, any improvement is felt at once right through to the producer. The market is firm on all the best class of goods.

BRASS GOODS—Brass goods are advancing in price. Many of the manufacturers have withdrawn their lists, but new figures have not yet been generally announced. The cheaper grades of work are still plentiful on the market, but the demand for the better article shows gratifying improvement.

RADIATORS AND BOILERS—Orders keep up strength splendidly, and manufacturers have little time to spare. The season promises to turn out a much better one than at first was anticipated. There is no change in published lists, and we quote: Radiators at 52½ and boilers at 50 and 10 off. Steam-fittings are 66 2-3 off.

METALS — Metals have shown a strengthening movement since last figures. Purchasing has been good, and the local markets are in a very sound condition just at present. We quote:—Ingot copper, \$15.50; ingot tin, \$34; lead, \$3.80; pig iron, Middlesboro No. 1, \$18.50 to \$19; Summerlec, \$20. Heavy scrap red brass is 10½c; light copper, 10½c; heavy lead, 2½c.

TORONTO.

Toronto, Nov. 28.—A fair trade is being done in all lines by the plumbers. It can not be called brisk, as this is the quiet season, except for finishing up work. Generally speaking the business is equal to, though not ahead of last year, with the prospect for a splendid development in the spring much better. There are not many changes in prices to record, except that brass goods are a shade higher, and there has been a change in the discount in lead pipe and waste. In iron pipe there has been a slight increase in the discount, and business in this line is reported better than in some others. The new price list in enamelware has gone into effect.

BRASS GOODS—While some price cutting has been going on in the cheaper grades this has not brought the business it was designed to, and the higher quality goods have sold just as well. The ruling prices are: Standard compression work, 70 per cent.; fuller work, 75 per cent. Flatway stop and waste cocks are 70 per cent., while roundway remain at 50 and 10. Compression bath cocks (No. 4) are now quoted at \$1.50 to \$1.60, and No. 4½ Fuller's, \$1.85 to \$2.10. Fuller bibs are at 75 per cent.

ENAMELWARE—There is not a great deal doing in the trade just now except in new buildings. The new Standard

Ideal catalogues have been distributed and the special grading has been withdrawn. Thirty per cent. off now prevails with the jobbers.

IRON PIPE—Business in this line is reported good for this season of the year. The active condition is due to considerable radiator work being done in shops and factory premises. On east iron fittings and flanged unions there has been an increase of five per cent. discount. The figures now stand: 1-in. black, \$5.11, and 1-in. galvanized, \$6.76. Cast iron fittings, 70 per cent.; flanged unions, 60; nipples, 70 and 10; malleable lipped unions, 55. Malleable fittings are unchanged at from 37½ per cent.

SOIL PIPE—There is practically nothing doing in this line as the ground is frozen and few, if any, services are being put in. Prices are unchanged. We continue to quote: Light pipe, 60; fittings, 70 per cent. Medium and extra heavy pipe and fittings are 70 per cent.

LEAD PIPE—This is in fair demand, and a good steady trade is felt. Caulking lead is from 4½c to 5c per pound. Traps and bends, 50. Pipe and waste are advanced from 30 to 27½ off.

SOLDER—This is the quiet season and the price is slightly reduced, the former quotations of three or four weeks ago prevailing. Wiping solder is now 18½; and half and half, 19c per pound. The demand continues fair.

BOILERS AND RADIATORS—After a fairly active season this is the resting period. The prices are unchanged. The prospects for the coming season are particularly bright.

EXPANSION OF VALVES.

The results of experiments to determine the expansion of valves and fittings in service involving high temperature, are given by the Valve World. Three flanges were taken, one of cast iron, one of ferro steel, and one of steel. They were exposed to varying degrees of heat for a period of 130 hours, the temperature being less than 500 degrees for 18 hours, 500 to 700 degrees for 97 hours, 710 to 800 degrees for 12 hours, and over 800 degrees for 3 hours. The average for 130 hours was 583 degrees. The view previously put forth by the Valve World was that cast iron subjected to continued temperatures of approximately 500 to 600 degrees takes a permanent expansion and does not return to its original volume when cooled. The results of the above mentioned experiments are stated as follows: Cast steel flange—no change. Cast iron flange—outside diameter increased 19-1,000 inch, inside diameter increased 7-1,000 inch. Ferro-steel flange—outside diameter increased 33-1,000 inch, inside diameter increased 17-1,000 inch.

PRESENTATION TO TRAVELER.

Fred. J. Ellis, who is well-known to the steamfitters between Toronto and Windsor, having been the representative of the Gurney Foundry Co., Toronto, in that field, was the victim of a surprise party in London one night last week.

Fred is leaving his present job on December 1, and this fact leaking out, about a score London's master plumbers and fitters captured him at the Gurney Stove Co.'s store at London, and on behalf of the trade of that city, expressed their regrets at his leaving that field and presented him with a gold-headed umbrella and the following address:

"On behalf of the plumbers and steamfitters of the city, we wish to express our sorrow on hearing that you are about to leave the employ of the Gurney Foundry Company, of Toronto, and thereby sever your connection with the plumbers and steamfitters of this city.

"For some time past you have been calling on us as the traveling representative of the above firm, and by your obliging manner and good nature have made a host of friends for yourself, who will always be pleased to hear of your success in your trip through life.

"As a token of our esteem we wish to present you with this small token as a memento of your many friends whom you have in the Forest City."

Mr. Ellis is a young man with a wide experience, having a practical knowledge of the hardware business, as well as plumbing and heating. He is also an experienced bookkeeper and some of the product of his pen has been published in the trade press. He has not announced what connections he intends making, but his many friends will wish him success in whatever line he turns his abilities to.

BOOK REVIEWS.**House Heating by Steam and Water**

—This is a work lately issued by the Plumbers' Trade Journal, and written by C. B. Thompson. It is a book of 265 pages, and is well worthy of possession by the working and employing steamfitter. Though possibly all would not subscribe completely to the ideas set forth, many knotty problems that come up in work are plainly explained and the book will be found most useful. It is written in a style devoid of all technicalities, and it is divided up into 57 chapters—each chapter dealing with a different phase of the subject. Numerous examples of steam and water heating are described and illustrated by clear cuts, so that they are quickly and easily

understood. It is a book that will prove helpful to all interested in the subject and is a valuable addition to the literature of the trade. Price, \$3. For sale in Canada by the Technical Book Department of the MacLean Publishing Co., Toronto.

Mechanical Drawing for Plumbers—

This book by R. M. Starbuck occupies a field all by itself. There is no other treatise similar to it. Every plumber that likes to lay out his work neatly and plainly has here one of the best text books of the trade. The instructions are clear and the examples shown are modern and up-to-date. For the young and rising plumber and for any one who would like to be able to clearly set forth his intended work in sketches and plans for his own guidance or for the purpose of explaining to his customers contemplated work, no better guide and hand-book can be found. The book contains 111 pages, and is well printed on good paper and well bound in green cloth. The price is \$1.50, and it can be procured in Canada from the Technical Book Department of the MacLean Publishing Company, Toronto.

Sewers and Drains—Sewers and Drains

is the title of a work by Anson Marston, C.E., and issued by the American School of Correspondence. It deals with Sewer Calculation and Design, Land Drainage and House Sanitation, Sewer Construction and Maintenance, and Sewage Disposal. Special stress is laid on the practical side of the subjects instead of dealing with theoretical and academic discussions. It is a practical working guide for the subject with which it deals. The volume is both readable and at the same time particularly adapted to self-instruction and home study. The language is simple and clear and the work is supplemented with well-selected illustrations. It is a work that should be in the hands of all who are connected directly or indirectly with this branch of engineering or who are interested in any way in the subject. A thorough index for quick reference is provided. The price of the work is \$1, and it can be had from the Technical Book Department, MacLean Publishing Company, 10 Front Street East, Toronto.

HEATING BOILER CATALOGUES.

Some notable heating boiler catalogues have been received from the American Radiator Company, Chicago. Two deal with the Ideal sectional boilers, Ideal round boilers, showing the features of construction and giving concise descriptive information and tables of dimensions and prices needed by the man who has to lay out and estimate a heating system. Both steam and hot water boilers are covered. The third publication

is devoted to the 48-in. size sectional boilers, and contains a discussion in detail of the general value of these boilers and of their construction, fuel economy and evaporative power. One particularly interesting section compares the Ideal 48-in. steam boiler with a fire-box boiler, both rated to carry about the same amount of direct radiation. An explanation is also given of the character of the interior surfaces of the boiler and of the facilities for cleaning the boiler with some detailed cuts bringing out minor features. To give an idea of the capacity of the boilers the book shows a view of the general offices of the company, which are warmed by two of these boilers. One of the interesting practical points about the book is a series of reproductions of photographs showing in steps how these large boilers are erected.

East & Corrin have been awarded the contract for heating and plumbing the new jail at Fort Frances.

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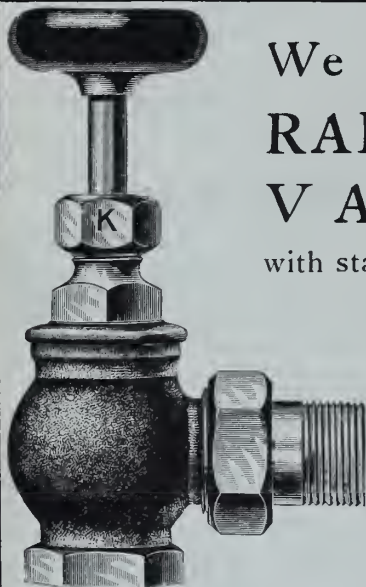
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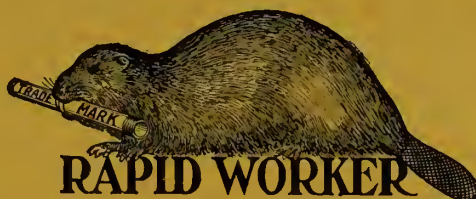
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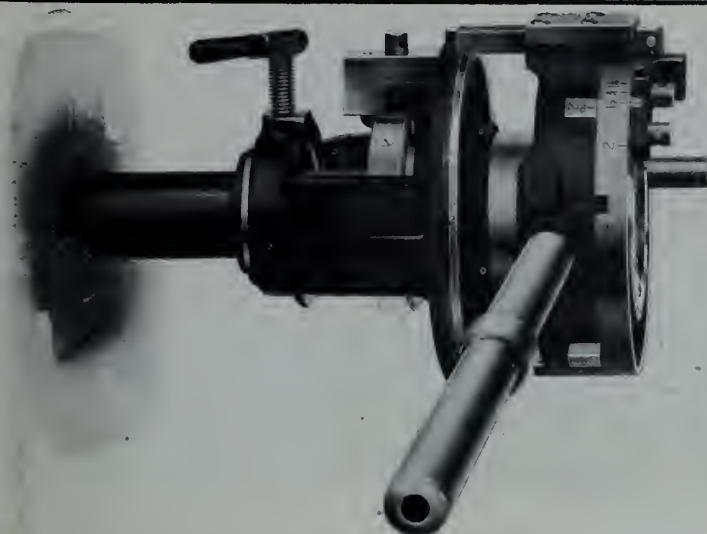
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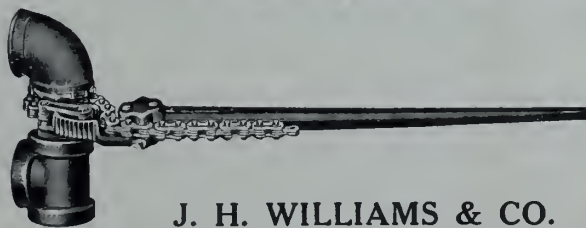


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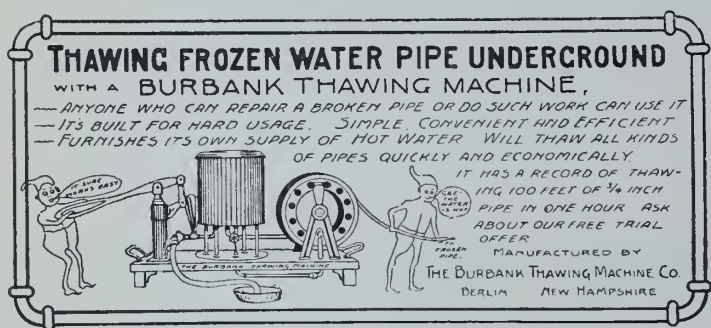
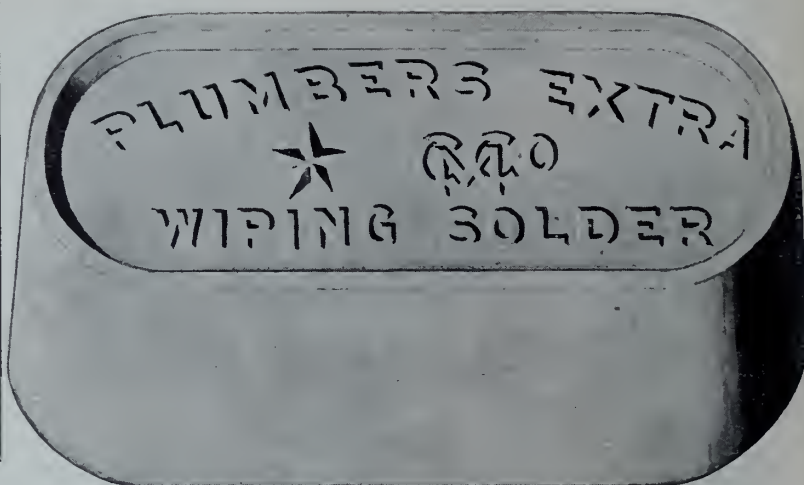
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MONTREAL, TORONTO AND WINNIPEG, DECEMBER 15, 1908

GOOD PROGRESS BEING MADE.

The effort being made to reorganize the trade in Toronto is meeting with encouraging success, good educational work being done by the organizer employed. At the last meeting nearly a score of new faces were seen and the next gathering is expected to be attended by fully one hundred of the most successful plumbers in the city. The leading workers in the second association which had a brief existence early in the summer, have joined hands with the parent body, and there should be nothing in the way to prevent the development of an association comprising all the best men in the trade, joined together for the purposes of educating themselves and uplifting the trade to the standing of a profession. The organizers of the association are wisely avoiding any of the pitfalls likely to be met with if an effort were made to regulate prices.

At the next meeting the proposed amendments to the Toronto plumbing by-laws will be discussed, these including amongst others the elimination of tile drains inside walls, the cutting out of the ventilation of closets when within three feet of the stack, and the making of local vents optional. Conferences have been held with the Medical Health Officer, and a committee from the architects will also be consulted before final action is taken.

Outside of Toronto greater attention is also being directed to the necessity of organization. At Hamilton and Brantford the appointment of qualified plumbing inspectors are live questions, and in other places the absence of by-laws and the existence of insanitary conditions and faulty plumbing is forcing the most intelligent master plumbers to talk about getting together.

The winter has just commenced and indications are that before spring arrives the foundation for a better state of affairs for the plumbing trade will have been laid.

EXAMINATION OF PLUMBERS.

Now that something seems likely to be accomplished in the way of bringing Toronto's plumbing by-laws thoroughly up-to-date, the subject of establishing an examination for master plumbers to pass before securing licenses should not be overlooked. Washington, St. Louis, Pittsburg and other American cities which have recently adopted modern by-laws have provided for examinations for both masters and journeymen, and Vancouver, B.C., has also made provisions along these lines.

In Minneapolis, where examinations were recently called for, 264 masters have been successful in passing, while 75 have failed, some as many as five times. The right to require an examination is being tested in the courts, and, in the meantime, those who have failed to pass are being allowed to continue business. The appeal is against the right of the city council to pass a by-law requiring an examination, but if the city has not the power the State Legislature certainly has.

The following are the questions put to the plumbers in the examinations which must be passed with a standing of 70 per cent.:

What is meant by sanitary plumbing as you understand?

Can ventilation pipes to traps ever be dispensed with where there is more than one fixture in a building?

Has the temperature of the atmosphere any effect on seal of trap, or to cause their siphonage?

Is it necessary that a roof eap should be used in order to make a good job, and what is its effect on the system?

Does an ordinary washdown closet afford more resistance against siphonage than an ordinary 1½-in. trap?

Make drawing of soil pipe and vent of water closet in basement, which is 10 feet away from main run, and show back-water valve.

What precautions are necessary in supplying ventilation to traps?

What is a trap and its chief requirement?

What kind of fixtures are prohibited in the plumbing ordinance?

May the venting of individual traps ever be dispensed with, if there are two fixtures on the same stack?

How is a vacuum formed in a plumbing system, and its cause removed?

Are there any set of rules for installing a water meter?

What is a waste pipe bi-pass? Make drawing.

Is there any means of protecting the inside of sewer pipes from the effects of sewer gas?

Make drawing and give size of vent and waste pipe for duplex house with closet and laundry tubs in basement, and two rain water leaders connected with basement soil pipe.

MANUFACTURERS HELP IN ORGANIZED TRADE.

A. L. Maedonald and C. C. Maedonald, of Maedonald & Sons, eastern sales managers of the Standard Ideal Company, Port Hope, are visiting the trade in Montreal

on behalf of the National Association of Master Plumbers, with the object of inducing new members to join the association, by pointing out to them the advantages of taking such a step.

It will be remembered that in an editorial published in the issue of Plumber and Steamfitter for Dec. 1st, it was suggested that manufacturers and jobbers could do good work in the cause of the association. Messrs. MacDonald are to be congratulated on the course they are taking, and we trust that they will meet with plenty of success in their canvassing. With the lead given them, it is to be hoped that other firms will follow suit, and do something to help forward the good work of the association. Every new member added to the roll call; every link strengthened in the chain of organization; brings nearer the complete realization of those ideals to which the association is pledged, and which mean so much to the welfare of the plumbing industry, and to those directly and indirectly concerned.

BENEFITS OF ASSOCIATION ARE MUTUAL.

If the dull season of the year has no other advantages it affords ample opportunity to look back over past conditions and undertakings and consider ways and means for betterments. These betterments may concern methods of doing work or extension of trade.

These considerations are bound to lead up to the question of team work—that is, association work. Nothing offers the same opportunity for conference with one's fellow-tradesman, nor offers such chances for the broadening of one's vision as does good association work when looked at in its broadest sense.

There is no doubting the fact that a regiment, and to a much greater extent a whole army, can accomplish more in a less space of time than each individual can separately. The individual views, needs and desires of each may be very different, but when there is the need of accomplishing a common good then the concerted action of the body as a whole is absolutely necessary.

Does not the plumber and steamfitter see how he has the opportunity of uplifting the trade, himself and the welfare of the public all at the same time?

Of course there are individual wants, which, of course, to each seems the most paramount need, but to quickly bring about the results, if they are really essential and desirable, action through association is the surest.

When the plumber joins his association then he will know his fellow-tradesman as he should, not as one to be feared or as one to be looked down upon, but one that he will consider is worthy of every consideration and one that is willing to concede the same to others.

Some plumbers seem to find peculiar reasons why they think they should not become members of an association. They know they should get in, but they think more of finding a reason why they should not.

Not long ago one advanced the idea that a certain one of his competitors was losing money on some of his work—that he did not know how to calculate his costs. He did not think it would benefit him to be in an association with such a person. But these are just the very two persons the association needs the worst—the man that knows and the one that does not know, and each needs the other's help. One will learn when the other shows him, and the one that did know will gain a benefit as well.

No matter what excuse you can think of, there are a hundred reasons why you should affiliate with your association to every one why you should not. Don't imagine you would be helping some one else by being a member,

but that you would be benefitted ten times as much as you benefit any other one person.

You can help your association and your association can help you a great deal more. The benefits are mutual.

HEALTH AND WATER SUPPLY.

The question of the effect of the water supply upon the longevity and health of individuals is very ably discussed by George M. Kober, M.D., in a paper entitled "Conservation of Life and Health by Improved Water Supply," as reported in the Engineering Review. The author says: "Water is a prime necessity to man not only as an article of food, but also for the proper degree of cleanliness of person, clothing and dwellings. . . . In our towns and cities the question of water supply has been solved by the introduction of public water works. . . . The needs for community water supplies are met according to the location of the town or city with reference to the availability of springs, streams, rivers and lakes. Since springs rarely yield a sufficient supply of water for general use, it is perfectly natural that in the majority of instances, surface water, like streams, rivers, lakes or ponds were utilized for public water works, and when these were not available, recourse was had to shallow and deep wells and so-called filter galleries."

The author, after entering into a detailed description of the composition and purity of river water and river pollution, takes up the question of the hygienic value of pure water. He says: "According to the census of 1900 there were 35,379 deaths from typhoid fever during the census year throughout the United States; and based on an estimated mortality of 10 per cent. it is within reason to assume a yearly prevalence of 353,790 cases of this disease. If we calculate the average cost for care, treatment and loss of work to be \$300 and the average value of a human life at \$5,000 we have a total loss in the United States of \$283,032,000 from one of the so-called preventable diseases. What has been said of typhoid fever is equally true of other water-borne diseases like cholera, dysentery, cholera morbus, diarrheal diseases and the transmission of the eggs of intestinal and other parasites."

In speaking of the effect of pure water upon the average length of human life, Dr. Kober says: "Professor Finkelnburg, of Bonn, estimates that the average length of human life in the sixteenth century was only between 18 and 20 years, and that at the close of the eighteenth century it was a little over 30 years, while to-day it is between 38 and 40 years—indeed the span of life since 1880 has been lengthened about six years. No two factors have contributed so much to the general result as the improvement of the air we breathe and the water we drink. Indeed we have ample evidence that with the introduction of public water supplies and sewers the general mortality in numerous cities during the past fifty years has been reduced fully one-half, the good effects being especially shown by a marked decrease in the number of cases of typhoid fever, diarrheal diseases and consumption."

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Steam Heating of a Country Residence

Description of a Low Pressure One-pipe Steam Heating Contract Job Costing \$1,200—Reproduced From the Plumbers' Trade Journal.

There are some special features in a low pressure one-pipe steam heating plant installed by John G. Gent, New York, for J. F. Makley, Larchmont, N.Y., that will appeal not only to the expert steam heating engineer, but to the novice and the practical man who wishes to be properly guided in a simple way in

It will be noticed on basement plan, steam leaves the boiler from one outlet, making a triple circuit to all risers, with a slight fall from boiler to most distant point on each circuit line. At the same time keeping the lowest end of steam pipe as far above water line in boiler as the situation will permit. Each flow line

as the amount of surface allowed for cubical contents.

In some cases after the size of radiators had been determined, the radiation was slightly increased by the engineer, using his experience and judgment, as the case required.

This plant includes a sectional cast-iron boiler of standard make, which is covered with plastic asbestos. All exposed pipes, both supply and return, in cellar, are also insulated by sectional covering, which not only gives a finished appearance to the work, but gives a cool cellar that can be used for any purpose, besides retaining more than 95 per cent. of steam generated for the purpose intended, namely, to warm the radiation above the cellar floor.

Low Pressure Obtained.

With a heating plant of this kind, it will not be necessary to carry more than half a pound pressure of steam at any time, even in the coolest weather and moderate weather, a mere vapor rising from the water will answer all purposes.

A reliable make of automatic air valve on each radiator is quite essential for this type of heating plant, notwithstanding the fact that the mains are all relieved of air at extreme ends as shown on cellar plans. And this is a special feature that will pay ten-fold, as it allows of the quickest circulation of the steam to extreme ends of lines without these end reliefs all air in main pipes will have to escape from radiation.

Where pipes pass through floors, ceilings or partitions, they are surrounded with metal tubes, and finished at ends with brass nickel plated escutcheons.

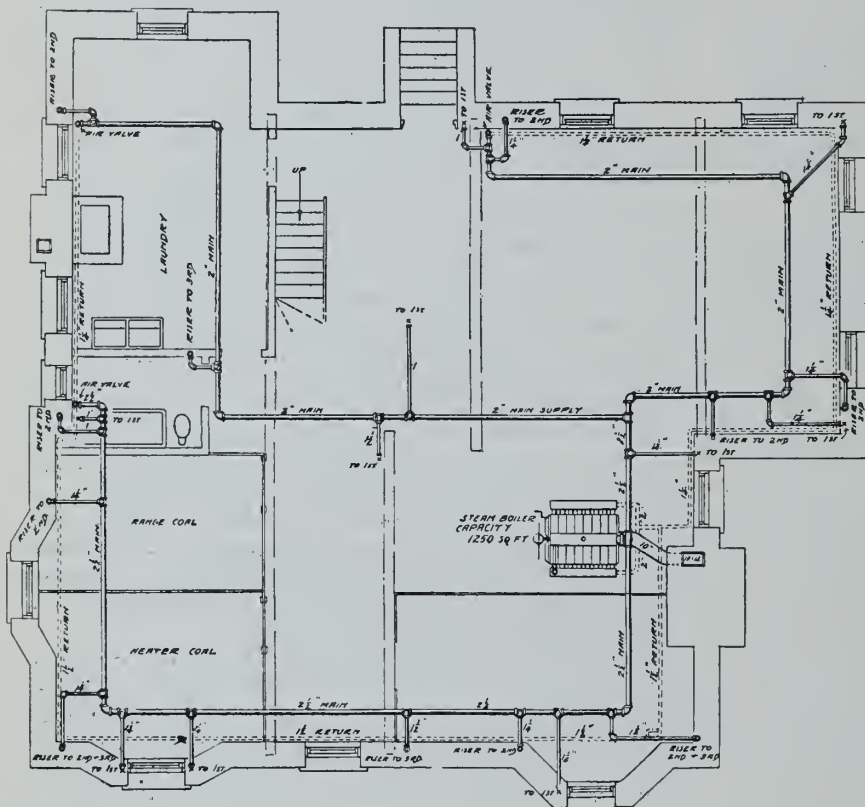
There is a total of twenty-four direct sectional cast-iron radiators, plain pattern, containing 884 feet of superficial surface, while the capacity of the boiler is 1,250 square feet.

The location of the radiators has been arranged in such a way, that furniture can be placed to the best advantage, and in some cases the radiator locations have been sacrificed for furniture, which was the wish of the owner.

Location of Radiators.

The following radiators are located at points as shown on plans.

First Floor.—Music room 2, rad. 22 inches high, 3 col., containing 72 square feet. Living room 1, rad. 22 inches high, 3 col., containing 51 square feet. Living



Basement Plan of the Makley Residence, Showing Location of Pipe Connections.

the principles of steam circulation for house warming purposes.

What we want, and what we are still looking for in the art of house warming and ventilation is efficiency, economy, simplicity, and safety of the apparatus for the modern dwelling of to-day.

Complications of any piece of work or machinery soon become a nuisance as well as an expensive investment, hence we should be guided by experience of those who have spent practically their lives in experiments at no little expense to find these things out.

The heating plant herewith illustrated is the embodiment of simplicity, yet having the features of almost perfection, and this is the result of about fifty years development in the steam heating business.

is relieved of condensation at its extreme end, and this condensation is carried back to boiler as shown in dotted lines below water level of boiler, having also a slight grade toward the boiler. Branches to all risers are taken from top of lateral mains, which feature has a two-fold advantage, namely, that it delivers dry steam to risers and admits of more easy adjustment of the branches to allow for expansion and contraction of the pipes.

It will be seen by referring to floor plans how this particular job was calculated as to the necessary surface to properly warm same, and this will be of value to those who have not the time or inclination to consult technical works, as the size of each radiator is given as well

room 1, rad. 38 inches high, 2 col., containing 40 square feet. Dining room 2, rad. 38 inches high, 3 col., containing 100

other in lavatory. All concealed risers are covered with hair felt and tightly corded. The walls of the house, up to the second floor, are of stone 18 inches thick, and the risers are set in channels on the inside with plenty of packing surrounding them, consequently there is

of feet of radiating surface on each radiator is shown in above schedule.

Radiation Surfaces.

The following shows the dimensions and cubical contents of each room on third floor, and the number of cubic feet of space one square foot of radiating surface warms:

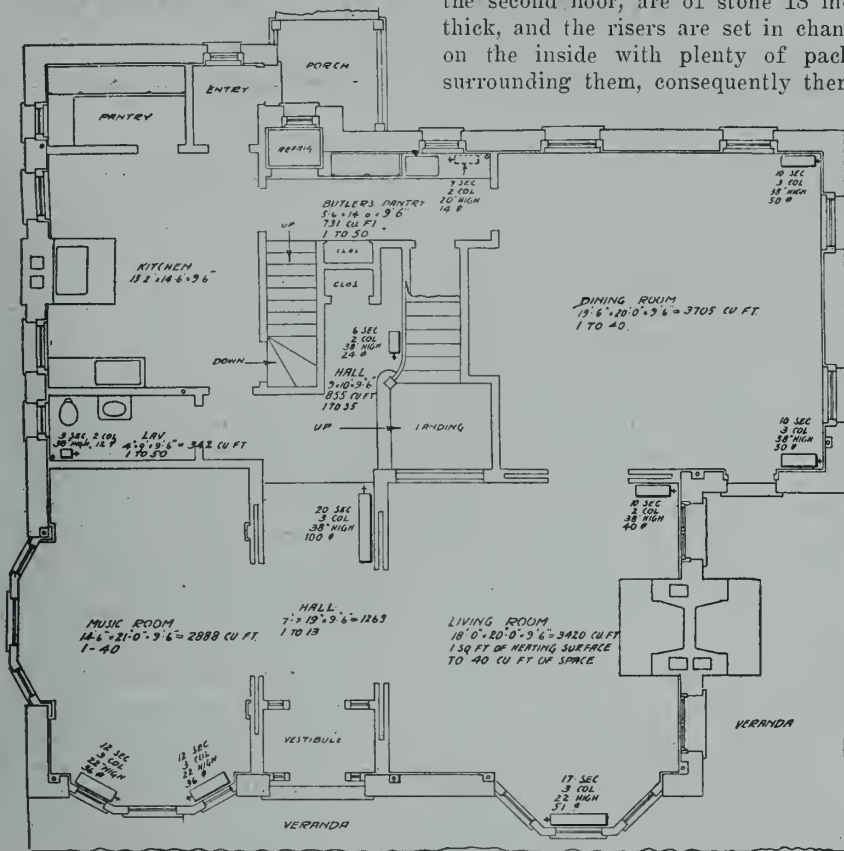
Guest's room No. 1, 12x14x8 feet = 1,344 cubic feet, 1 to 45. Guest's room No. 2, 14x19x8 feet = 2,128 cubic feet, 1 to 45. Servant's room, No. 1, 10x13x8 feet = 1,040 cubic feet, 1 to 50. Servant's room No. 2, 7x14x8 feet = 896 cubic feet, 1 to 50. Bath room, 6x9x8 feet = 432 cubic feet, 1 to 35.

The building was completed the latter part of the winter, and the heating system during zero weather.

The house, though situated on high ground and exposed to the elements, particularly the strong winds from the Sound, is as comfortable as any house.

The Ingram and Davey building at St. Thomas will be ready for occupancy about the middle of January, being so far completed as to be roofed and having the glass put in so that the interior workers will not have a cold job. The steam fitters expect to have heat on this week. A further description of this building will be given shortly.

Vancouver's building returns for the past month are very gratifying. Not only was there an increase over November of a year ago, but the returns of the year to date are \$800,000 more than for the first eleven months of 1907.



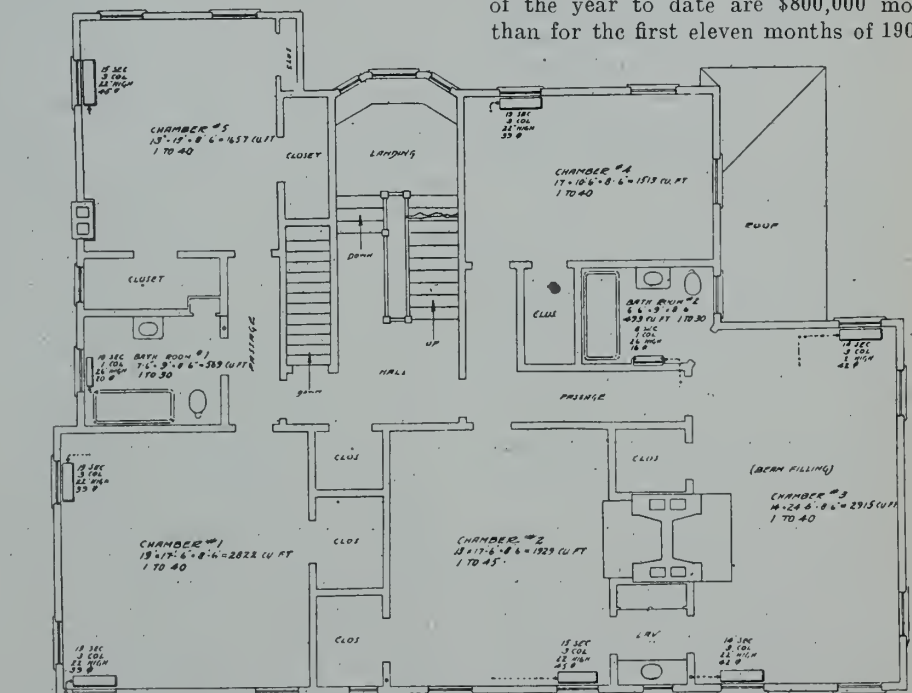
Plan of First Floor of Makley Residence, Showing Location of Rooms and Pipe Connections.

square feet. Lavatory 1, rad. 38 inches high, 2 col., containing 32 square feet. Butler's pantry 1, rad. 20 inches high, 2 col., containing 14 square feet. Hall 1, rad. 38 inches high, 3 col., containing 100 square feet. Hall 1, rad. 38 inches high, 2 col., containing 24 square feet.

Second Floor.—Chamber No. 1, 2 rad. 22 inches high, 3 col., containing 78 square feet. Chamber No. 2, 1 rad. 22 inches high, 3 col., containing 45 square feet. Chamber No. 3, 2 rad. 22 inches high, 3 col., containing 84 square feet. Chamber No. 4, 1 rad. 22 inches high, 3 col., containing 39 square feet. Chamber No. 5, 1 rad. 22 inches high, 3 col., containing 45 square feet. Bath No. 1, 1 rad. 26 inches high, 1 col., containing 20 square feet. Bath No. 2, 1 rad. 26 inches high, 1 col., containing 16 square feet.

Third Floor.—Guests room No. 1, 1 rad. 38 inches high, 2 col., containing 32 square feet. Guest's room No. 2, 1 rad. 38 inches high, 2 col., containing 56 square feet. Servant's room No. 2, 1 rad. 38 inches high, 2 col., containing 20 square feet. Bath room, 1 rad. 38 inches high, 2 col., containing 12 square feet.

It will be noticed by referring to the first floor plan, that only two risers are exposed, one in butler's pantry and the



Second Floor Plan in which the Location of the Rooms and Pipe Connections Are Pointed Out.

little chance of their being interfered with in extremely cold weather.

On the third floor there are four rooms and a bath heated, the size and number

For the past month they were \$345,400, as against \$221,400 last year; and for the year to date, \$5,610,845, compared with \$4,829,030.

Preliminary Treatment of Sewage

Extracts From the Recent Report of the Royal Commission Appointed by the British Government on Methods of Treating and Disposing of Sewage.

The composition of different sewages varies to a large extent, and it is important to consider how strength of sewage, as affecting purification, may be measured. The amount of filtration necessary to produce an effluent of any given standard of purity varies, to a wide extent, with different sewages.

The variations in strength of the sewage of different towns depend chiefly on the amount and nature of the water supply; the extent to which the houses are provided with water closets; whether a separate system of sewers is provided for storm waters; and what trade effluents (if any) are admitted into the sewers. Dr. Fowler has pointed out that a fairly accurate idea of the strength of sewage, as affecting purification, may be arrived at by measuring the number of gallons of sewage per head per day arriving at the outfall and making allowance for the other factors, while other witnesses have suggested that the usual tests, such as "oxygen absorbed" are sufficient.

Where, however, a more exact measure of strength is needed, we are inclined to think not only on theoretical grounds, but also as the result of experience, that this can at present best be obtained by ascertaining the amount of dissolved oxygen taken up during the complete, or practically complete, oxidation of the organic and ammoniacal matter in the sewage.

The purification of sewage is to a large extent a process of indirect oxidation through the agency of bacteria, and one of the chief things required to be known about any particular sewage is how much oxygen is required for its complete oxidation. The rate at which the sewage will take up oxygen is also a factor of importance, in that it furnishes information as to the character of the organic matter.

The dissolved oxygen test is a biological process, and it differs from the ordinary tests—such as oxygen absorbed from permanganate—in that it takes account of practically the whole of the organic matter, and not merely that of a particular kind.

The amount of oxygen which a sewage can take up is, however, only an approximate measure, for purposes of purification, of its strength, as some constituents of sewage are oxidized by filters or land more readily than others, and the proportion which they bear to

the total organic matter varies largely in different cases.

Determining Amount of Oxygen.

To determine the amount of oxygen which a sewage requires for its oxidation, a definite quantity of the sewage is allowed to remain in contact with a known excess of oxygen until it is completely oxidized, and the oxygen remaining over is then measured. This can be done either: (a) By diluting the sewage largely with good tap water, estimating the oxygen in solution in a portion of the mixture, and allowing the remaining portion to stand in a bottle which is filled completely and shut off from all access of air. At least two months must be allowed for this, after which the oxygen remaining in solution is determined. The difference represents the oxygen used up. (b) By keeping the sewage, without diluting or diluting only very slightly, continuously aerated in a bottle containing a measured excess of air. Dr. Adeney, who has suggested this plan, has found it to be very much more rapid than the first.

A serious disadvantage in the use of the dissolved oxygen test as a measure of the strength of sewage is that it requires, even with the more rapid method suggested by Dr. Adeney, a comparatively long time to oxidize the organic matter completely by dissolved oxygen. From the results of a considerable number of laboratory experiments with method (a), we thought that a period of about two months might be generally taken as sufficing for the oxidation of nearly all the oxidizable matter, excluding (to some extent, at least), cellulose and fat. Later results, however, appear to show that this may be too short a time under ordinary conditions of experiment. Though we have not made enough observations on the point to speak definitely, we are satisfied that the oxidation of cellulose and fat in diluted sewage, under the aerobic conditions of our experiments and at ordinary temperature, is slow. In practice, however, there are but few instances of the treatment of crude sewage on biological filters, and the amounts of cellulose and (probably) of fat which are present in the liquids usually treated (settled sewage, septic tank liquor, and precipitation liquor) are relatively small. By method (b) and by making use of a mechanical shaker attached to a suit-

able gas apparatus, Dr. Adeney succeeded in oxidizing strong septic tank liquor by means of atmospheric oxygen, without any dilution with water, while he followed the course of the reaction by determining at different intervals of time the quantity of oxygen required by known volumes of the liquor. In this way he reached the nitrification stage of the process in twelve days. The method is thus a great advance, as regards time required upon the dilution method. Recently Dr. Adeney has invented an ingenious apparatus for carrying out the dissolved oxygen absorption test, by which the rate of absorption of oxygen as well as the total amount of oxygen taken up can be readily measured.

What Experiments Show.

As bearing on the question of strength of sewage as affecting purification, we may refer to our experiments at Accrington. A double contact bed plant filled with rather fine and graded material was provided in duplicate. On one set of contact beds, septic tank liquor was treated at the rate of 80 gallons per cube yard per day; on the other set, the same septic tank liquor diluted with an equal volume of tap water was treated at double the rate. The percentage purification was slightly greater in the case of the contact beds treating the weaker liquor. Two exactly similar percolating filters, 9 feet deep, filled with coarse material, were also provided. On one filter, septic tank liquor was treated at the rate of 100 gallons per cube yard per day; on the other filter, the same septic tank liquor diluted with an equal volume of tap water was treated at double the rate. In this case the percentage purification was slightly greater with the filter treating the stronger liquor. The differences in the percentage purification were, however, in both plants so small that we think it may be taken broadly that within ordinary limits of concentration and volumes treated, it is the amount and nature of the organic impurity present which mainly determine in practice the ease or difficulty of purification; in other words, that, within practical limits, mere dilution does not affect the size of the filtering plant which is necessary. Of course if the dilution is so great as to cause waterlogging of the filters, their purifying power would be seriously diminished, and this statement would not hold good.

The evidence which we have received and our own experience show that it is generally more economical to remove from the sewage, by a preliminary process, a considerable proportion of the grit and suspended matter, before attempting to oxidize the organic matters on land or in filters.

It is true that at Leeds, Sutton, Hampton, Hendon, Market Drayton, and elsewhere, crude sewage has been satisfactorily purified in filters with almost complete absence of nuisance, but at most of those places, this plan has been abandoned because of the rapid choking of the filters.

As regards the treatment of crude sewage on filters, we have ourselves made detailed observations at the following places: Hampton, Hendon, Little Drayton, Maidstone, Newton-le-Willows and Withnell, and reports on these observations are published.

There are also many cases in which crude sewage has been passed over land, but the evidence shows that land treatment of crude sewage is liable to give rise to nuisance by the accumulation of solids on the surface of the land. Moreover, in some cases these solids are apt to form an impervious layer which interferes with the aeration of the soil, and so impairs the efficiency of the treatment.

Screening.

On arriving at the works the sewage is usually passed through coarse screens for the purpose of removing the grosser suspended matters, such as sticks, cloths, paper, corks, etc.

The removal of such suspended matters is almost essential where the sewage has to be pumped, and in other cases it is usually considered an advantage. Although the amount of suspended matter which is removed by coarse screens bears only a small proportion to the total suspended matter, the screenings have some manurial value, and there is usually no difficulty in getting farmers and others to take them away.

The screens in use are of various kinds, and some are provided with automatic apparatus for clearing them. Experiments with fine screens were carried out at Leeds with a view to ascertaining whether it was practicable to remove a large proportion of the total suspended solids in this way. With a screen of a mesh of 30 to the inch, however, rather less than 10 per cent. of the total of the suspended matters was removed. The use of fine screens is always attended with difficulty as they choke readily, and the experience of Leeds seems to show that where tank treatment is provided as a preliminary process, the cost of fine screens would not be justified.

In the circumstances obtaining at Birmingham, Mr. Watson prefers not to screen the sewage, but to allow the whole of the suspended matter to flow, with the sewage, to the first sludge tanks. The sludge itself is screened, to remove the grosser solids, before it is disposed of on land.

Grit or Detritus Tanks.

Most of the witnesses whom we have examined favor the removal of the heavy suspended matters, such as grit or road detritus, as a first operation, and our own observations have shown that in most circumstances it is desirable to provide tanks for this purpose. These tanks are usually designed so that the speed of flow will allow the mineral matters to settle out of the sewage, while the bulk of the organic suspended matters are carried forward. The extent to which the heavy matters need be settled out of the sewage as a first operation depends in some measure on the subsequent treatment which is to be adopted.

Where septic tanks are to be used which will only be cleaned out at long intervals of time, fairly thorough preliminary settlement of grit is generally desirable. The removal of the sludge which has accumulated over a long period in a septic tank is, as a rule, a matter of difficulty, as the sludge is often so thick that it cannot be pumped unless sewage or water is mixed with it. Much mineral detritus in the sludge increases this difficulty.

We also consider that in the case of septic tanks from which a portion of the sludge will be removed periodically, preliminary settlement of the mineral detritus is as a rule, desirable. Tanks to be used in this way are generally provided with sludge channels formed in the concrete floor. If the sludge to be drawn off contains much mineral detritus, it will not flow to the channels but will remain in heaps at the side.

In the case of a very small works (flow of sewage up to, say, 10,000 to 15,000 gallons per 24 hours) where septic tanks are used for the preliminary process, the provision of grit or detritus tanks which require constant sludging may necessitate more labor than would otherwise be the case, and in such circumstances it may be more economical to allow everything to go forward into the septic tank. Although the presence of the mineral detritus in the general tank sludge would make the sludging of the tank a more difficult operation, the saving of labor between the intervals of sludging would probably more than balance the extra cost of removing the sludge.

Where precipitation or sedimentation tanks are to be used, and especially if the district is sewered on the combined

system, it will, we think, generally be found better to settle out a considerable proportion of the mineral detritus before allowing the sewage to pass into the tanks. The necessity of giving thorough preliminary settlement of the grit is not, however, in these cases of so great importance, for the presence of grit in sludge renders the latter more amenable to pressing and drying.

Sedimentation Tanks.

All tanks are sedimentation tanks, but it is convenient to limit the expression to tanks in which the sewage is allowed to settle, without the aid of chemicals, and from which the sludge is frequently removed. In some cases the tanks are allowed to stand full, and the supernatant liquid is drawn off by a floating arm. In other cases the sewage is allowed to flow through the tanks slowly, but continuously.

Experiments which were carried out at Leeds and Sheffield showed that, with the sewages of those cities, quiescent settlement for two to three hours was sufficient to remove a large proportion of the suspended solids entering the tanks, and to produce a fairly good tank liquor. No precise rule, however, can be laid down as to the period of quiescence which is required to effect a given reduction of the suspended solids. Certain kinds of sewage contain more solids which settle very slowly, than other kinds. For example, a large proportion of the solids in sewages which contain brewery or tannery waste, or wool scouring liquor, are difficult to settle. To maintain this form of settlement in a highly efficient condition, the deposit in the tank must be removed after every first or second filling.

The amount of settlement does not depend alone on the period of flow, but also on various other factors, such as the shape of the tank, the nature of the suspended matter in the sewage, and the length of time during which the tank is used without being cleaned. If the tank is not cleaned out frequently, the deposited sludge begins to ferment and the gas produced carries suspended matter with it, as it rises to the surface of the liquid. As a general rule, if the filters to be used are constructed of fine material, on which it would be undesirable to put a large amount of suspended matter, we consider that the period of flow should be from 10 to 15 hours, and that the tanks should be cleaned out at least once a week. Before either kind of sedimentation is adopted, the nature of the suspended matter in the sewage which is to be dealt with, and the rate at which it settles, should be considered.

(To be Continued.)

Troubles with Heating Apparatus

Some of the Complaints Met With and How to Overcome Them—By C. E. Oldacre.

There is one class of trouble that comes to pretty near everyone engaged in the heating business, and that is complaints from users of apparatus that has been installed during the previous summer and which for one reason or another have not been got down to working conditions. We do not refer to the job that has been skimped or the one that has been put in on a strict price consideration, but the well laid out heating plant, be it warm air, hot water, or steam.

No matter how well a heating plant may have been laid out or how well the work may have been executed there is every likelihood that there will be a complaint of some nature or other from the new user, especially if the user is not entirely familiar with the particular form of heating or type of apparatus. Everything may be left in the best of order and good and sufficient directions for operation of the heating system may have been posted at a point convenient to the user, but for all that, if the user is not of a mechanical turn of mind some trouble of greater or less magnitude is liable to crop up when least expected.

Be Ready to Answer Questions.

There is no better plan for the heating man, if he wishes to overcome all of the difficulties and have the largest percentage of satisfied customers to ask them to notify him when they are going to start up the apparatus and then for him to be on hand, start the apparatus and give personal instructions as to the operation, and clearly answer any of the thousand and one questions that may occur to the mind of the average user. He at once shows to the user his personal interest in the well working of any apparatus installed by him, which is appreciated by every user, and at the same time he is in a position to satisfy himself from personal observation of the plant in operation that everything is in first class working order. It affords him the opportunity to clear up many points that may not be clear to the user and to set the user to rights where otherwise the management of the apparatus would be entirely wrong.

On every boiler, heater or furnace there are two or more dampers, and no matter how simple their use may be to the heating man, they may be a puzzle to the user, and their action on the furnace may be misunderstood.

It is fair to say that with the average well constructed heating plant that the principal causes of trouble are poor drafts and bad management. In former articles we have dealt with the question of chimneys and drafts and the trouble from this source has been explained at some length, but even where the draft is all that could be reasonably expected yet the heating man is liable to be called on to explain many seeming troubles that cause complaints.

Complaints About Smoke.

One of the first complaints heard early in the season is that a fire can not be started without the furnace, heater or boiler emitting smoke into the cellar. Maybe the damper in the smoke pipe is closed tight, or perhaps there are two dampers in the smoke pipe and the user has taken notice of only one. It is the custom of the manufacturer to provide his heater with a damper in the collar of the smoke outlet and the furnace man or fitter puts another damper—a turn damper—in the smoke pipe at a convenient point say two to four feet from this smoke outlet.

The furnace may have a dust damper between the combustion chamber and the ash pit, and this damper may have been left open. There may be a clean-out at the base of the chimney, and this may have been left off.

Or possibly the user has never had the care of a furnace before and he does not understand the proper way to start a fire. He may go to work and put in plenty of the best kindling and then leave the draft doors at the bottom open entirely too wide, thus causing the furnace to emit volumes of smoke into the basement or cellar. Or he may load the fire-box up with coal long before the kindling has become thoroughly ignited, causing the fire to be smothered and eventually to go out entirely. The furnace or heater may be one of the indirect type and has a direct damper and this direct damper has not been opened. If the heater is of the indirect type there may be one or more clean-out doors which have been carelessly left open.

Sometimes too Much Heat.

Another class of complaint is that of too much heat in the early fall when only a small amount of heat is needed. This complaint is more likely to occur where the heating apparatus is fully

equal to the needs at all seasons of the year. That is, it has been put in of full and ample capacity and needs to be held in reasonable check when the weather outside is moderate. This is very likely to occur from shaking the grates too much. It is quite easy to explain that the more the ashes are allowed to accumulate on the top of the grates—not at the bottom—the less is the draft that can pass through the fuel and consequently the less heat that will be had on account of the smaller amount of fuel that will necessarily be consumed.

Keep the fuel up to the bottom of the feed door to get the best and most economical results and shake the grates according to the amount of heat required. The clearer the fire is kept the greater should be the heat received from the heater and the more the ashes are allowed to accumulate in the fire box the less will be the heat.

The frequency with which the grates are shaken or agitated is one of the very best means of controlling the heat and at the same time it regulates the fuel consumption to the weather conditions.

Size of Coal to Use.

The quantity and size of the coal used is the last thing with which to find fault, it is always best to be sure that all other possible causes of trouble have been thoroughly looked into and found to either exist or not exist. Where an apparatus has been built adapted to any given class of fuel it will generally be found that very good average results can be had with the most of the fuel of that class.

After the means of regulation through the amount the grates are shaken comes the question of the setting of the damper in the smoke pipe. The more this damper is turned to the closed position the less will be the volume of gases that can be carried to the chimney and the more it is open the greater is the volume of the gases that will be carried off for any given size of smoke pipe. Just where the damper wants to be set is somewhat of a matter of experience with each individual case, as the velocity or intensity of the draft through every chimney will vary from some other chimney, and it may vary in the same chimney, but it is perfectly safe to turn the damper, after the fire is once well started, to a position half way between full open and completely shut. But the proper point, as has

been stated, is a matter for experience and testing.

Fire Box Full of Clinkers.

Then comes the complaint heard along about the time of the first good cold snap—not enough heat. Very likely you may find the fire in about the same condition that you would expect to see it for the most moderate weather or perhaps even a poorer condition. You open the feeder door, look into the fire box and here apparently is a good deep fire. Then you open the ash pit doors and look underneath the grates and there is not a particle of light from the fire to be seen, or if any, only in spots. You shake the grates so as to get the fire clear on the grates and you find you have not got left hardly enough good live coals to start a fire with. But there is only one thing to do in such a case and that is put on the drafts and get the remaining coal to glowing and then gradually add fresh coal till you bring the fuel up to its proper height—the bottom of the feeder door.

Some time since the writer had occasion to look into a complaint where the user claimed that even in very moderate weather he could not get sufficient heat and investigation showed the condition of the fire was just about what has been described above.

On first examining the furnace, about nine o'clock in the morning, little or no heat was coming from the furnace and the owner said he was sure it was not large enough to do the work; that he had burned lots of coal and was not afraid to burn it if he got the results. He had been operating right along with a shallow fire. The fire he had in the furnace looked allright from the feeder door, but when it was shaken down there was hardly more than enough to start a fire. The fire box was gradually filled and after the fire was going fairly the draft doors were closed and the damper in the smoke pipe was closed pretty near two-thirds. This took about an hour's time. The owner was told to leave it in this condition and another examination would be made about two o'clock in the afternoon. But he said he had no faith in that kind of firing—it would eat up more coal than he cared to buy, and that the fire by that time would be entirely burned out. On the return at two o'clock the fire was in a good condition, had not burned too freely—the entire house was warm all over, from top to bottom, and on asking the owner what he thought of the furnace all he could say was that his only complaint now was that he did not see why he should not have known before how to get the heat from the furnace, and his complaint was against himself for this.

Journeyman's Errors in Plumbing and Heating

An incident of a journeyman's experience is well worth telling, if it brings to attention a natural mistake actually made by one mechanic and likely to be repeated by others if they are not warned to avoid it. G. C. C. gives the following in the Metal Worker.

A journeyman of more than usual ambition and with experience enough to be trusted with almost any job begged to be allowed to lay out the roughing in work for a good job without help. He was given the plans and specifications for a residence and not interfered with nor coached in any manner until he said the job was ready to lay over until the house was ready for the fixtures. I then looked over the work for the purpose of criticising it for betterment before the finishing work got far enough advanced to make alterations very expensive should any changes be necessary.

The house was one favoring the placing of much of the supply work in the rough. There were two bath rooms—one for servants on the third floor, and one for the family on the second floor. Besides the fixtures of these there were trays in the basement and an odd lavatory on the first floor aside from slop sink, kitchen sink and pantry sink. The hot water service was by storage tank in kitchen heated by range fire, with connections to a coil in the house heater for winter, and further supplemented by automatic gas water heater for sundry occasions.

Sacrifice Utility for Show.

I saw at a glance that the journeyman's valuation of display had tempted him to sacrifice a good point in favor of one poor in comparison, because it permitted manifolding the supply lines in a showy sort of way over the trays in the basement. There was really no decent way to assemble the stops in the kitchen, and scattered branches are a feature no one desires, so it was only natural to boldly dip the main to the basement and begin the distributing lines at one appropriate point, but in doing this all certainty of circulation was lost. I said, "This work looks well; you have figured and spaced the pipes and paired the cocks quite symmetrically. Is the main bath room over the kitchen?" "No; the fixture edge just laps the off side of the kitchen, but the third floor is in line," said John. "Now, John, there is where we are going to get into trouble. You can't circulate this dip, and have not attempted to, and there will be a kick about drawing so much dead cold water from the hot faucet in the lavatory of the main bath room. The servants will say nothing, and the location of first floor fixtures, together with the reasons for separate lines are in our

favor, but we have no such excuse for poor service at the main lavatory. Cut into the hot in the bath room and bring stubs for a loop into view on the kitchen ceiling, and arrange a stub for the cold to the same fixtures. We will bring three nickel-plated lines across the kitchen ceiling and put the stops at the storage tank. That will give us circulation there whether it looks as neat or not. That change won't kill your manifolds either. Just turn the lines so killed into a separate pair for the pantry sink. It will make a more expensive job than we get paid for, but I see no other easy way out, since so much of the work is already in place. And, John, don't ever forget that the kind of service a layout is going to give is the prime factor in most jobs. Convenience of secondary features, somebody's pocketbook and appearances all have to be considered, but to a reasonable degree they are generally governed by the result sought in all first-class work. These supplies are the only changes. The soil pipe work is good, and the details of the supply work are excellent." John admitted the improvement the changes would make.

Errors Made by Fitter.

We were doing the heating of the house, too, and the fitter was finishing the water test of mains and risers. He also was ready for inspection. The heating work had been put up by plans from the construction department, and, therefore, no changes were found necessary. The fitter was much interested in a job of heating nearby in which a fitter of another shop had been roughing in on much the same plan as John had been doing the plumbing of our work. However, it was the other shop's regular course to let the fitter adapt the work to the house as conditions affecting installation presented themselves on the job. There is no question that a man accustomed to meeting difficulties on the job is more at ease without aid than one would be who had always worked to plans, but the fellow who is trained to following good plans would eventually make the best workman, and the opportunity comes frequently enough to use brains and training, no matter what the shop's regular method may be. We dropped into the basement of the other house expecting to meet the man on the job, but there was no one in sight. "Here is a trick no plans would have to tell me not to do," said my fitter. He pointed to an indirect stack that had been assembled on the floor and hoisted into place with the connection end next the wall, and so close that nothing could be done in the future without removing the casing and lowering the whole stack. We

looked about in silence for a few minutes. I said, "I am averse to dropping in here and criticising this work under such circumstances, but as you raise no other points, I will point out two worth remembering. Here is a stack having the disadvantage common to most indirects in circulation. In addition, it has no reduction of the main directly after the branch, for it is taken off, and the

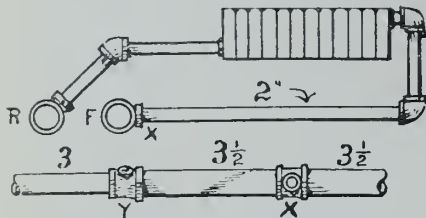


Fig. 1—Piping and Connections Installed

next branch is for a large second floor radiator. The reduction in the main at that point in mains of this size is less than the two branches taken together, and the balance of the main layout does not help matters."

Improvements Suggested.

To explain more in detail what was found Fig. 1 shows the indirect connections as they are, F and R being flow and return mains. The longitudinal sketch of flow gives the sizes, X being branch to indirect, looking horizontal, and Y being branch to second floor radiator, with main tee in 45 degrees position. Fig. 2 illustrates a better method, a being the branch to indirect with main tee in 45 degrees position and second branch b in horizontal position. In Fig. 1 the reduction in main is at Y, thus taking off two branches before reducing, and the advantage is given to the second floor branch where retarding would be better, while the branch for the indirect, where every advantage is needed, is placed horizontal, thus taking cooler water as well as allowing the second floor branch to rob the indirect. Indirects have so little head to produce circulation that every advantage of position and reduction should be given to their branches.

In Fig. 2 the reduction in the main is made at a, and the position of the tee is 45 degrees. This, with the change in velocity due to the fitting and the end of the 3 1/2 in. reamed to actual diameter insures that a good flow will drive through the branch to the indirect. The area of 3 in. nominal is 7.068 in. Either machine or wheel cut would give it about the nominal area. The nominal area of a 3 1/2 in. pipe is 9.62 in., while the actual area is 9.886, thus giving nearly 2.82 in. area for the indirect regardless of its inclination to go on or the advantage in the position of the tee, and the nominal area is a 2 in. pipe is only 3.41. This

leaves about 0.60 in. area deficiency in supplying the indirect by reduction at full velocity. The shortage will likely be made up in full by the inclination of the water to rise to the branch. The tee at b favors the hotter water going forward to a first floor branch, and by its position retards the second floor flow. In the connection as it exists and was found. I told John the water in the flow is going to pass this indirect in a way that will astonish somebody, the owner most likely, by the frigid quality of the air that comes through the register face. Whoever fires the job will likely think that harder firing will bring hotter air, it will, and very likely fill the pipe system with hot air, too, as the expansion is a dead line and taken from the return. Hard firing with a scrimpy arrangement is sure to make some steam, and in this case, if it goes further than pounding, the water of the system will be expelled through the expansion tank and then, there is a chance for a cracked section at least in the circulator. You see, that to connect the tank with the extension of a flow riser not only frees part of the system of air automatically, but furnishes a possible exit for steam bubbles, as in the case where a crazy negro fired a job on a hot day last year until the pounding suggested ghosts and caused him to desert the house and call in a policeman for protection. If we had not been fixed for trouble there we might have had that job to overhaul before the house was occupied. A connection to a return at the tank keeps the

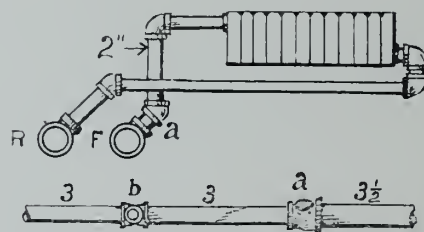


Fig. 2—Improvement Suggested.

tank warm and also gives whatever advantage there is to be gained from circulation through the tank connections.

SANITARY DRINKING CUP.

At the recent International Tuberculosis Congress at Washington, D.C., an exhibit which attracted much attention was that of the Luellen cup and water vendor, showing the apparatus in operation; the fixture of pure white enamel making a striking appearance. The apparatus is operated by placing a penny in the slot and turning the crank, which allows a "sanitary" cup (a stack of which are held inverted in a tube) to be placed upright in position and the water to automatically fill the same. The

drinker then either carries away the cup or throws it into a receptacle provided for them. Should the cup be placed back on the fountain when the machine is again in operation the old cup will be pushed out of place and only a new one will be filled with water. The fountain is indeed a sanitary one and deserves much credit.

HEATING BOILERS BY ELECTRICITY

An experiment, which in all probability is the first of the kind to be made, will soon be tried out by the Rochester Railway & Light Company, Rochester, N.Y. According to heating experts no tests have yet been made to determine the commercial practicability of heating the larger type of boilers by electricity. At the lower falls the company is generating about 8,000 h.p. by the use of water turbines. The only steam boiler in use at this plant is a 100-h.p. boiler which is used for heating purposes throughout the winter, coal being the fuel. It is now proposed to use the surplus electrical energy for the purpose of heating the boiler until the water has reached a temperature where the resulting steam can be used for heating purposes. There are several obstacles to be overcome before the experiment can be carried to a successful conclusion, but the company engineers are confident that the objects are not insurmountable. Under ordinary conditions this method of heating is impracticable on account of the cost. But for several hours every day there is an excess of energy developed which can be used for the experiment at no additional cost to the company. This energy will be sent into the boiler, except during the comparatively short time it is used for carrying the heaviest loads on the city circuit. M. D. Goud, one of the mechanical engineers of the company, has, according to The Metal Worker, been in New York investigating the subject and learning what has already been done along a similar line. The different heating engineers whom he interviewed have said that no attempt, so far as they know, has ever been made along that line, but they were unable to suggest any obstacle which would be likely to defeat the project.

LOOKS LIKE ELECTRIC LIGHT.

A very effective gas lamp has recently been introduced which has every appearance of an arc lamp, but gives a softer and more steady light. It consists of incandescent gas mantles, which are inverted so as to throw all the light downward. The mantles are protected by a globe of ground glass, which distributes the light and conceals the fact that the lamp uses gas instead of electricity.

How the Stockkeeper Struck a Snag

S. V. N., in System.

The new stenographer had been at work for two or three weeks when the boss turned to her and said off-hand:

"I am a crank on what I call 'non-exclusive information.'"

"What's that?"

"Why, I don't want anybody around the place who can cripple the business by leaving suddenly, or by getting a monopoly of information that I do not have. You've been here a couple of weeks; have you seen anything around the place that savors to you of a monopoly of that kind?"

The new stenographer was a bright young lady who bade fair to become a permanent employe of the establishment of Smith & Jenkins, city plumbing supply jobbers. She was bright and capable, and had been in the line for a number of years. The way she handled the work showed that she took advantage of all the short cuts and grasped the reasons as well as the details of business.

"Why, yes; I have. We handle here thousands of different items. The stockkeeper seems to be able to produce a given item right on the second. If you want a two-inch brass valve it takes him about half a minute to find it. But suppose he was to get sick or was to leave all of a sudden, is there anyone else around the place who could find and hand out those supplies?"

Mr. Smith leaned back in his chair. That same question had often come to him and he had been going to take it up some time himself; so he was interested.

"Yes, that is a good point to make. What can we do about it?"

Adapted a Library System.

"I once worked for a few days in a library and I noticed the facility with which the attendants would bring every volume which I called for. Many of the attendants, in fact, remembered a large number of books by their numbers. If you asked one of them off-hand for Pitman's Manual of Shorthand he would say, 'Yes, that's 407 Q 38,' and make out a slip for it and get it for you at once. Why can't we apply this same system here?—give every fitting a number. Then when we order our supplies—when we talk about them—when we have anything to do with them, in fact, specify them by number as well as by name. In a few months' time every one around the office will be able to remember a large number of the supplies by their numbers as well as by their names. Then whatever comes up you are prepared for it, for all of us know, or can instantly refer to the number of a fit-

ing, which number designates its location."

The boss was impressed by this argument and the new system was gradually installed. By employing numbers and lists a simple and comprehensive system of this kind was soon in operation.

The anticipated trouble began in an unexpected manner. A customer dropped in for a few fittings and Mr. Smith telephoned down to the stock room to have them sent up. The stockkeeper was out. Telephoned again in a few minutes. The stockkeeper was still out. The customer began to get a little impatient—Smith telling him the latest story meanwhile. When the story ended and the customer was still impatient Smith telephoned again. Stockkeeper still out.

"Can you find three 420 A's for me," said Smith, turning to the stenographer.

"Certainly, they are in bin 20, fourth row, box A," she replied, off-hand.

"Well, you needn't go yourself, send James, the office boy."

The boy came back without the fittings.

"What's the matter, can't you find them?" said Smith.

"Yes, sir, I found them all right, but the stockkeeper came back just as I was bringing them up and took them away from me. Said he didn't allow anybody nosing around the stock room and getting the stock mixed up in his absence."

Things started to move then and there. Smith went down himself for the fittings and gave the stockkeeper notice to hunt for a new job.

LEAD PIPE 350 YEARS OLD.

When the great Cardinal Wolsey, Lord Chancellor of England, under King Henry VIII., built Hampton Court Palace, at the beginning of the sixteenth century, he determined to bring his supply of drinking water from some famous fresh water springs at Coombe, some distance away, in the Surrey hills. An elaborate method of collecting the water was adopted. Three principal conduit houses were built, which still exist. By means of a number of underground feeders the water was conveyed from the springs to these conduit houses, whence it flowed in separate pipes to Norbiton, where a junction was effected. From this point the water was taken directly to the palace through a lead pipe 2 1/4 in. in diameter, which ran at a depth varying from 3 to 6 feet, except where it crossed the Thames, where a considerable dip was necessary to carry the pipe

under the river. This water formed the sole domestic supply of Hampton Court Palace for nearly 350 years, and was only discarded about 30 years ago, on account of the increased building about Coombe having polluted some of the sources of the supply.

By order of the British Commissioners of Public Works the old lead pipes between Coombe and Hampton Court, which became a royal palace at the death of the Cardinal, were taken up, some 10 to 11 years ago, after being buried since the year 1520. It says much for the honest workmanship of the plumbers of those days that these pipes were found to be in perfect condition and very few of them had any trace of wear and tear. They included some of enormous length, as much as 200 feet being found without a joint. These old pipes, moreover, are of considerable value because they were made at a time when the method of extracting the silver from the lead had not been discovered. They are of a substantial nature, averaging about 11 lbs. to the foot. According to the Metal Worker, the undertaking has proved a decidedly profitable one for the Department of Works, which will be some thousands of dollars in pocket by it.

WHAT'S IN A NAME?

Four customers had called on the plumber that morning, asking when they could have their jobs completed and the plumber reflected that the order by mail would necessarily take time; so, going to the long distance telephone, he got his favorite supply house on the wire. This conversation ensued:

"Hello! Is this the Plumbers' Supply Co.?"

"Yes."

"Who's talking?"

"Watt."

"What is your name?"

"Watt is my name."

"Yes. What is your name?"

"My name is Watt—Charles Watt."

"Oh! Charles Watt. Well, Watt, send me the order I mailed yesterday on this noon's express."

"All right. Are you Schott?"

"No, I'm not shot, nor half shot."

"I mean, are you John Schott?"

"No; I'm Knott."

"Well, then, what is your name?"

"Will Knott."

"Why won't you?"

"Uh! My name is William Knott, of Notterdam. I want that order sent out on to-day's noon express, sure."

"Certainly, Knott. Good-by."

The new sewer by-law at Ladysmith was carried without opposition. Only 100 votes were cast, of these only 8 were against the by-law. The work is to cost \$50,000.

With Our Correspondents

The Editor does not hold himself responsible for the opinion of correspondents. Short, crisp letters will be appreciated. To insure publication, the name and address of the writer must accompany the communication, not necessary for publication. Sketches of work or methods will receive our earnest attention. These columns are open to our readers at all times without charge, and any questions or experiences will be given proper space.—Editor.

WANTS EXAMINATION TESTS.

Editor Plumber and Steamfitter. I have read Mr. Russell's letter in your journal of November 16, in which he states that a vast amount of preparatory work will have to be done before the objects mentioned can be considered even in a formal way.

Now, does friend Russell think for one moment that what Brother Cooper has suggested in his letter has not been gone through time and time again at previous conventions, or does he want us to go over all that has been done and make us believe that we know nothing? Or, as he would imply, that the majority of plumbers are not business men, but merely plumbers who will figure for twenty years and never learn anything? I have not been figuring for twenty years, but I think I have learned quite a lot in the few years that I have been in business.

I perfectly agree with friend Russell's remarks when he says that we must look within for all this trouble, also as to the average plumber not understanding the "scientific" way of figuring, but the business way. I agree also that that is where the vast amount of preparatory work will have to be done before we understand his "scientific" way of figuring.

As to being curious to know what Brother Cooper's questions will be I could almost presume what they are, and as to limiting the membership of a permanent organization in cities to one-half, I believe in all bona fide master plumbers who can pass an examination, and also any journeyman who intends becoming a master plumber doing the same, and if qualified should be admitted to the association if they wish. The small oyster is more essential to the large fellow than the large one is to the small.

I hope when Brother Cooper takes his referendum vote he will have the largest rally that the trade has yet seen.

WM. YOUNG.

London, Nov. 27, 1908.

BACK VENTING AGAIN.

Editor Plumber and Steamfitter: I am pleased to notice that my recent question started an interesting discussion in regard to back venting. I see that the majority of plumbers favor back venting, but it seems strange that Winnipeg, Calgary, Edmonton and Strathcona do not compel the plumbers to back vent, if, as a number of your correspondents claim, you cannot get per-

fect sanitation unless a system is back vented.

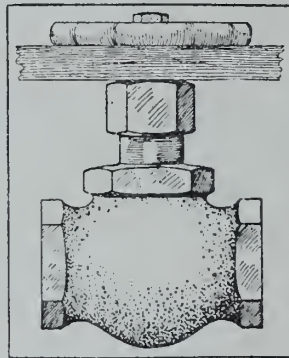
My experience, I admit, is limited, but I fail yet to find where an ordinary four-fixture job needed back venting to prevent the traps from syphoning.

J. H. PRITCHARD.

Summerside, P.E.I., Nov. 28.

TURNING A DAMAGED PACKING NUT.

When a packing nut on a globe valve becomes damaged so that the threads will not follow their course, place a piece of wood between the hand wheel



Repairing Valve.

and the nut, as shown in the sketch, and turn both at once. This will greatly assist in turning the nut down to its proper place.—Henry H. Brand.

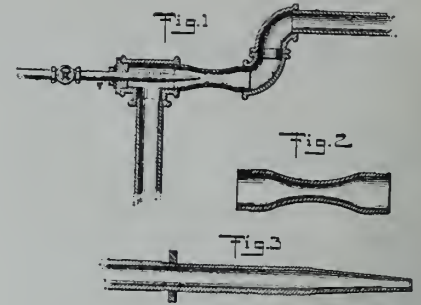
EJECTOR MADE OUT OF PIPE FITTINGS.

A simple ejector may be made out of ordinary pipe fittings, which will compare very favorably with some of the ejectors on the market, writes B. A. Johns. It may be used in draining a flooded cellar, in which case it may be attached to the ordinary water faucet for motive agent. It can also be used for emptying cisterns or in excavations for new work where water is struck. (Of course, in this case, steam will be used as motive agent).

Some time ago I was engaged in building a reservoir, and at a depth of 15 feet a spring of water was struck. Having no means at hand to get the water out of the excavation, decided to make an ejector out of some old pipe fittings I had in the tool chest. I succeeded in making four that kept the water level down while the work was being done. One of these ejectors worked night and day for nearly three weeks until completely worn out, owing to the fact that

a great amount of sand and gravel was carried through.

These ejectors can be duplicated as follows: First take a 1 1/4 x 6-inch



Ejector for Draining Cellars.

nipple; screw on each end of same any kind of fitting so as to preserve the threads. Heat same in the middle to a white heat. Then swedge down until outside diameter is about 3/4 inch. When cold remove the fittings, and the cone is made (see Fig. 2). Now take a 1/2-inch pipe, heat one end to a welding heat, and swedge down to a long point. A 3-16 rod may be inserted in the end to give the hole the right dimension, as it may be drilled out afterward. When cold, thread the pipe about 4 inches and screw on a jam nut (see Fig. 3). On the "rim" of a 1 1/4-inch elbow into which screw a close nipple. On the other end of the nipple screw another elbow, forming a kind of step or stop. To this elbow may be attached either a hose or a pipe to carry off the water. On the opposite end of the tee attach a reducing bushing, into which insert the nozzle shown in Fig. 3. Care should be taken to get the nozzle in perfect alinement with the cone, and when in proper place, screw up the jam nut with some packing behind it, to make it air tight. In the other opening of the tee attach a pipe or a very heavy hose, preferably "iron-clad," as the suction will have a tendency to close it up.

Electrically warmed hot beds for accelerating plant growth has been the subject of some experiments by G. Hartman, Turbine Ont. It is stated that he employs a heater comprising about 260 feet of 1-12-in. iron wire wound in even 2-in. coils on 1 1/2-in. iron pipe. The coils are connected in series and mounted on porcelain knobs on a piece of asbestos board. A frame about 6x8 feet in size has a floor on which is about 5 inches of soil. The top of the frame is covered with two sashes. The heater is placed under the floor, and current is taken from a 110-volt circuit. It is added that the energy actually received last year was 15 amperes at 80 volts, and that the hot bed was kept quite warm and tender flowers and vegetables developed rapidly in the early spring weather.

Are Traps with Concealed Cast Partitions Safe?

M. Stone, Jr., Plumbing Inspector, Greeley, Colo., in a Talk Before the American Society of Plumbing and Sanitary Inspectors.

There are cast iron traps which are perfect as far as the soundness of the trap and its partitions are concerned, but I find no excuse for installing a trap of this character in a system of plumbing when there are so many traps, of which one is positive that they will do what is required of them after their installation.

A trap is of value just so far as it complies with the requirements that should be embodied in every good trap. A good deep seal, non-syphoning, smooth interior and self scouring are a few points that must not be overlooked when deciding on the trap to use. Then besides these points it should also be required that it must have no partitions or mechanical devices with a possibility of sand holes or disintegration by chemical action or any other imperfection to either let the water down below the seal, or permit gas to pass above the water line and out at the fixture.

Most traps with partitions are made of cast iron and are, consequently, open to the last-named defects. In most cases it is not convenient to examine or test the trap for imperfections of this nature and in some it is a physical impossibility to so determine without cutting the trap to pieces to get a look at the inside. This condition brings us to the next bad feature of the trap constructed with cast partitions.

The surface of the partitions, being cast, are nearly always very rough and uneven no matter how careful the molder may be in his work, and this leaves a very rough surface to foul up even if it is scoured to some extent. But as far as scouring is concerned, it is commonly conceded that the general run of traps with partitions absolutely refuse to do any such a thing. But they are very apt to catch lint and lose their seal through capillary attraction. Of course it is possible to have just as deep a seal with a cast trap with partitions as with any other trap and one can probably get a trap of this kind that will not syphon any more readily than traps without partitions. And I presume there are also traps with partitions that will stand against evaporation as well as other traps, but such traps can certainly not excel in any of these points if it is set side by side with other traps that are made to stand these tests and have no partitions in them.

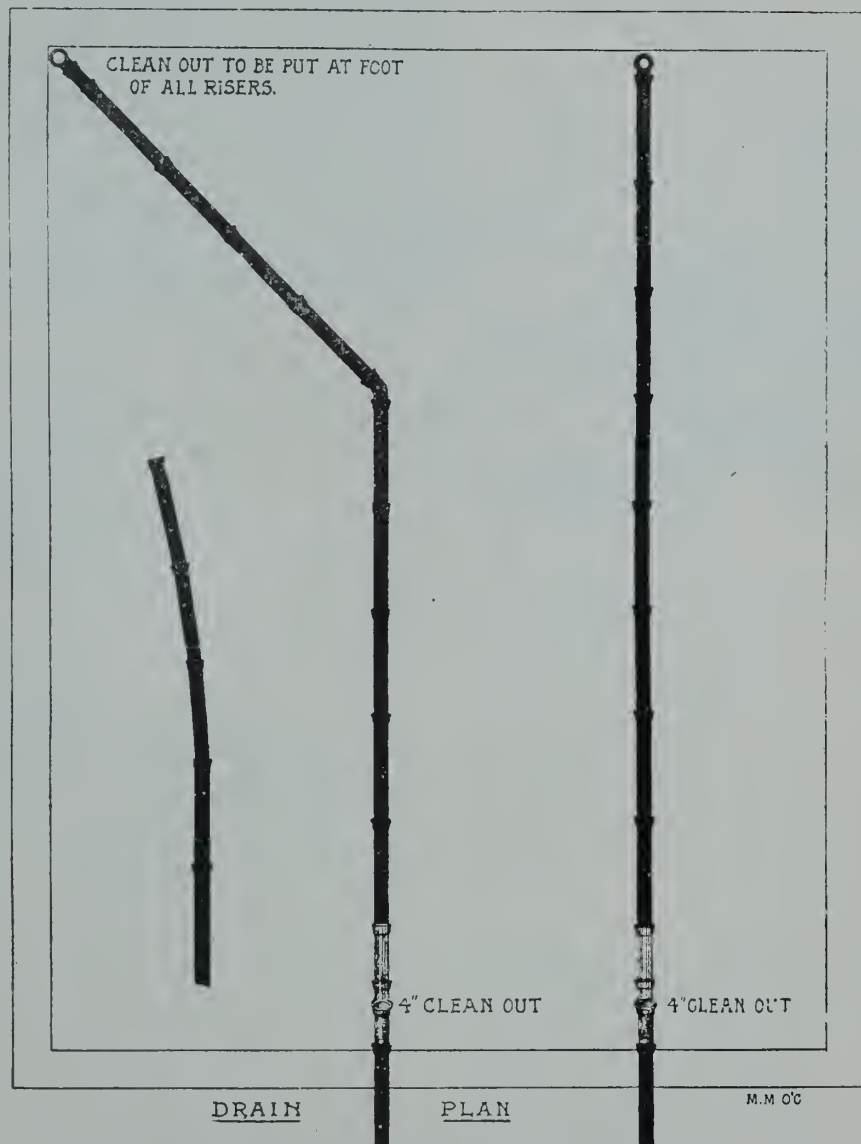
Finally I cannot see why one should use a trap with partitions that is open to the above objections and has no real advantages over other traps, except a possibility that it may be installed for

thirty cents less than others. But just listen to the arguments advanced by the wily salesman; a member of this fraternity told the writer once that you could just poke a five-dollar bill down in your pocket every time you installed one of his traps, as it didn't have to be vented. I told him I couldn't see it that way, and anyway I had too much

money already. Lo and behold! On his next trip he had the same trap with him, only it now had a vent coupling on it. I presume it was put there because his trap needed no vent and for no other reason.

In the Plumber and Steamfitter of December 1 an error was made in the explanation of two illustrations in the article on "Faulty Chimneys and Drafts." If the explanation is read by reading "Fig. 10" for "Fig. 9" and vice versa, the correct meaning will be secured.

OTTAWA PLUMBING CHART NO. 6.



ALL DRAINS MUST BE LAID IN A STRAIGHT LINE, AND ALL CHANGES IN DIRECTION MUST BE MADE BY USING BENDS WHERE NECESSARY. JOINTS IN NO CASE WILL BE PERMITTED BROKEN FROM A STRAIGHT LINE IN HUB OF PIPE (SEE CUT ON LEFT). ALL DRAINS TO HAVE FALL OF $\frac{1}{4}$ " TO EACH RUNNING FOOT AND TO BE CONNECTED TO PRIVATE DRAIN OF HOUSE, OUTSIDE OF WALL, AND TESTED BY PLUGGING CLEAN OUT WITH BAG OF OATMEAL OR OTHER SUITABLE PLUG. TRENCHES MUST BE CLEAR OF WATER AND HAVE HOLE IN EARTH AT EACH JOINT FOR INSPECTION OF SAME.

All tile drains must finish below top of cement or earth floor and have strainers in end and top of trap. Trap if necessary must be extended to top of finished floor with pipe and pipe must have hub on same for holding strainer drains from street line into house must not be covered up until inspected and approved of.

NEWS OF THE TRADE IN CANADA

A. Kyle & Son, plumbers, etc., Montreal, have registered.

Thomas Lockhart, plumber, Galt, is slowly recovering from a serious illness.

H. W. Ralston has established a plumbing shop at 6 Arthur Street, Toronto.

W. S. Brock, Winnipeg representative of Somerville, Limited, Toronto, is on a trip to the Pacific Coast.

Sanford Evans, the new Mayor of Winnipeg, is a son-in-law of Edward Gurney, president of the Gurney Foundry Co., Toronto.

Ex-Mayor John H. Fulford, of Brockville, has donated \$500 to the town for the purchase of a public fountain to be placed in Court House Park.

It is proposed that the Toronto Board of Education employ a plumber to go from one school to another, and do all the plumbing repairs that are necessary.

A number of the smaller master plumbers of Calgary have protested against the proposal of the city council to raise the tax levied on them from \$5 to \$100.

A. J. Jackson, Toronto, Ontario sales representative of the Amherst Foundry Co., Amherst, N.S., left on Dec. 8 for a week's visit to the headquarters in Nova Scotia.

The Driard Hotel, Victoria, B.C., is to put in new Turkish baths with a 22-foot plunge bath in connection. The price of the work will be between \$4,000 and \$5,000.

H. Shotton has installed a new steam heating system in the court house at Kamloops, B.C. He is putting in a low pressure steam system in the sanatorium at Tranquille.

J. Hainsworth, 48 Queen Street, Berlin, is preparing to move into new premises on Foundry Street, next February, and will add stoves and electric wiring to his business, which already includes plumbing, heating and tinsmithing.

Louis Payette, who recently resigned as sales manager of Warden King & Son, Montreal, has accepted the agency of Somerville, Limited, Toronto, for Quebec and the Maritime Provinces and, beginning with the new year, will open an office and sample room at Montreal.

A gasoline tank exploded in the plumbing department of McKelvey & Birch, Kingston, and Arthur Savage was injured. Savage was engaged in making repairs to the tank when there was a loud explosion. He was struck on the right arm by the head of the tank, which was blown out.

Pugh & McCullough, Saskatoon, during the season installed plumbing fix-

tures in the following residences in that city: M. Jordan, H. H. Smith, Mrs. Curtin, G. H. Noel, D. Webster, G. P. Gibbins, Dr. G. A. Munroe, F. Kerr, W. Coulthard, J. F. Cairns, W. H. Cleveland, W. H. Coy, A. E. York, A. Coglon, the King Edward School and the Coy Laundry.

The St. Catharines School Board has let a contract for the new \$23,000 school to be erected in St. Patrick's Ward. A. Riddell & Son get the plumbing at \$1,586. The board will also erect a four-roomed school in St. James' Ward. Wolff enamelware was originally specified for the two schools but this has been changed and Standard Ideal ware will now be used.

The Railway Commission has issued an order in regard to the lighting of passenger cars on all Canadian railways, whereby Pintsch compressed oil gas, or acetylene gas under the absorbent or commercial acetylene system, shall be used for this purpose. Two or three exceptions are made; the use of electricity is not prohibited, and the order does not affect cars where lamps using mineral or seal lamp oil are installed.

Those who are behind the movement to appoint a plumbing inspector at Hamilton are meeting with delay. A meeting was held last Thursday night to consider the appointment of such an official by the city, but the aldermen refused to take any action because this year's council will be retired at the end of the month. The matter will not be allowed to drop, however, and next year's council will have to face it, it is hoped with better results than this year's.

Robert Fowler, one of the proprietors of the Mainland Iron Works, and brother of James Fowler, plumber, Vancouver, met with a serious accident the other day. He was hammering the rod out of the piston of an ammonia compressor, and was struck in the eye by a jet of ammonia, which he did not know was in the piston. It was under pressure of about 150 pounds to the square inch. Mr. Fowler suffered agony, but it is not thought he will lose the sight of the injured eye.

Cluff Bros., Toronto, were plaintiffs and Thomas A. Norris and Thomas D. Lockhart, of Berlin, defendants in a suit before Justice Riddell last week. The defendants were sued for a balance of \$429.34 of an account. Defendants bought goods from Cluff Bros., totalling \$622.44. Thomas A. Norris severed his connection with the Galt business to accept a position in Toronto, selling out to his partner, Edgar A. Norris, the new firm assuming all

liabilities, but five months later the latter firm assigned. Cluff Bros., on the assignment, received about \$50. Judge Riddell, after ordering the return of money received to the defendants, gave judgment for the plaintiffs for \$572.44, with interest and costs.

At a recent meeting of the Toronto Engineers' Club the question of a septic tank process was discussed. T. A. Murray read a paper and in the discussion which followed the conclusion reached was that such a plant would be of no benefit to the city of Toronto, and if installed would still continue to pour undesirable sewage into the lake. The members were also of the opinion that the city acted too hastily in important measures of this kind. Mr. Murray pointed out that the commissioners had concluded that the two main questions to be considered in the case of a town proposing to adopt a system of sewage purification were, first, the degree of purification required in the circumstances of that town and of the river or stream into which its liquid refuse is to be discharged, and, second, how the degree of purification required can, in the particular case, be most economically obtained.

The Western Plumbing & Heating Co., Saskatoon, installed plumbing and heating at the residences of Mrs. Copland, J. W. Alecock, J. A. Aikin, A. E. Young and A. H. Gebbie. Plumbing was done in the King Edward Hotel, Great West Furniture Co.'s store, King Edward bath rooms, B.C. restaurant, the Luke Laundry, English Chop House, high school, city sedimentation basin, Rogers' Fruit Co.'s warehouse, and the residences of W. J. Bell, B. Chubb, Mitten Bros., Salvation Army officers', Mr. Gordon, J. D. Ferguson, W. Hopkins' store and residence, F. M. Selanders, C. H. Stevenson, Kusch Bros., and Dr. Weaver. Dr. Croll's residence was hot water heated, and similar systems were installed in residences at Aberdeen and Zealandia. Plumbing and heating was installed in the new court house, the new fire hall and the Battleford court house. The heating system at J. F. Cairns' store was also overhauled and extended.

The following contracts have been completed by Elford and Cornish, Saskatoon; plumbing houses for Mrs. C. F. Falkner, Mrs. Lawson, R. Wilson and T. Duun. Plumbing and heating in houses for W. Cassidy, M. A. McArdle, G. Rose and G. Stephenson. Plumbing was done in the Sommerfeld block and St. Paul's Hospital. The latter was also heated with hot air. Hot air furnaces were installed at the residences of C. Smith, E. Duffus, B. Elliott, P. F. Woolhouse, H. W. Way, H. Timmins, W. S. Timmins, Mr. Bell, Mr. Jones, Mr. Lemery and J. Newell. Hot air

systems were also installed at St. John's rectory, St. John's hall, the Baptist Church, Whitfield's store, Gardiner's restaurant at Sutherland, Jones' store and dwelling at Watrous, and Rock's Hotel at French. Hot water systems were installed in the residences of A. J. Whitfield and L. Williams. Plumbing was done at the Flanagan pool rooms and a hot water heating system installed. Plumbing and steam heating were done at Alexandra school. A steam heating apparatus was installed in H. Askamp's Hotel at Watrous. Soldan and McLaughlin's block was steam heated. A big contract yet remaining to be done is the Great West Furniture Co.'s warehouse. Two Bright Idea boilers and about seventy radiators will be used.

PLUMBERS WOULD BE ALDERMEN.

Hamilton has had two plumbers in the city council pretty regularly for several years back, in the persons of Aldermen Wallace and Norman Clark; St. Catharines has had a plumber as Mayor, and Harry Mahoney, Guelph, also broke into the charmed circle last year. Now Toronto seems likely to follow the example, two well known



ROBERT M. YOUMANS, TORONTO.
Candidate for Alderman in Ward Six.

men in the trade having accepted the invitation of their friends to seek election.

In Ward 2 Robert M. Youmans, 235 Carlton Street, has broken the ice and from reports received he is likely to be

a winner in his first campaign, a rather unusual event. Mr. Youmans is a member of the Ways and Means Committee of the Master Plumbers' Association at



ALBERT WELCH, TORONTO.
Candidate for Alderman in Ward Four.

present engaged in revising the plumbing by-laws and if elected would prove a capable alderman.

In Ward 4 Albert Welch, senior member of the firm of A. Welch & Son, plumbers and stove merchants, 304 Queen Street West, has also made the plunge and as he has been a successful business man in the ward for over 20 years and is well known, he should provide one of the surprises looked for in the coming campaign.

West Toronto will also have a plumber battling for the mayoralty in the person of Sam Ryding, who has been a public figure in the suburban city for a number of years.

Are there any other plumbers in the municipal swim?

CUTTING PIPE WITH HAND SAW.

W. O. Hay, in Popular Mechanics, tells of a steamfitter who had to go 18 miles to fit up the exhaust line of a steam engine having connections for 3-in. pipe, and found upon his arrival that the pipe cutters were forgotten. Not caring to go back for the cutters he began to look about for a way to cut the pipe. As a common hand saw with 10 teeth to the inch lay at hand a trial was made to cut the lengths of pipe with the saw. To the surprise of everyone on the job he was enabled to cut off five lengths of 3-in. pipe in a

short time. Only one filing of the saw was necessary.

MIXTURE FOR PIPE JOINTS.

Steam, hot and cold water pipes can be put together with plumbago, or graphite, mixed in common black oil to the thickness of axle grease. Apply to the threads as if using white or red lead. If the pipes are to be taken apart at any future time, they will separate as easily as they were put together. There will be no corrosion. The same is true of flange gaskets used for steam or water. They make a tight joint and never stick to the flanges.—Popular Mechanics.

KINGSTON PLUMBER'S ADVERTISEMENT.

The illustration herewith shows a reproduction of an ad. inserted in one of Kingston's daily papers last week. It is out of the ordinary and appears

Plumbing

Hurry Up Jobs

demand mighty quick action! We try hard to meet all such calls.

We are not infallible, but our reputation—in this respect—is decidedly in our favor.

In an emergency

Test Us!

David Hall

66 Brock St.

Phone 335

A Kingston Plumber's Ad.

likely to attract considerable attention. Many people have "hurry up" jobs for plumbers, but the general impression is that plumbers aren't looking for that kind of work. Mr. Hall wisely endeavors to overcome this wrong impression.

CONTRACTS AND BUSINESS OPPORTUNITIES

Waterworks and Sewage.

Ladysmith, B.C., will have a sewerage system to cost \$50,000.

Twenty thousand dollars in to be raised in Yorkton for the improvement of the waterworks system.

Renfrew Town Council have passed a by-law to raise \$5,000 by debentures for the extension of the sewerage system.

Negotiations by the Montreal City Council for the purchase of the plant of the Montreal Water & Power Co. are proceeding.

Splendid progress is being made with the new waterworks system of Hespeler, mains having already been laid on several streets.

The new pumps at the Guelph waterworks station have been tested, found satisfactory, and handed over to the water commissioners.

A by-law will be submitted to the Burlington ratepayers for the purpose of authorizing the instalation of a waterworks system at this place.

Peterboro will vote on two by-laws on Jan. 4, one for \$6,000 expense incurred in building up the water front and the other for \$15,000 for street extensions.

London ratepayers will vote on a scheme to increase the water supply of the city by 1,500,000 gallons daily by taking in springs and erecting a pumping station at a total outlay of \$441,000.

The by-laws to authorize the raising of \$30,610 for the extension of the sewerage system and \$26,000 for the extension of the waterworks system, Saskatoon, Sask., have been given their second reading.

In Victoria, B.C., neither of the tenders for the two pumps for the salt water high pressure system was quite in order, as both ignored the city specifications wholly or in part and substituted their own. The tenders were put in by R. P. Rithet & Co., who offered to supply the pumps for \$20,590, and the Victoria Machinery Depot Company, for \$18,180.

Pembroke ratepayers carried a by-law to ratify a contract with the Pembroke Electric Co. The corporation are now empowered to raise the sum of \$10,000 for the purpose of installing an electric pump, 200 horse-power motor and the necessary trip-valve for the stand-pipe. The contract with the Pembroke Electric Light Company covers a period of ten years.

Contracts have been awarded in Hamilton for the instalation of a sewer-

age system for the mountain top residents. The contract was given to G. F. Webb, whose price was \$2.29 a foot, or \$26,140 for the whole job. M. A. Pigott put in a tender of \$39,990, while the tender of the City Engineer was \$35,843. The work is to be paid for by the people benefited, but the pipe is to be supplied by the city at an estimated cost of \$5,000.

The following contracts have been awarded in connection with the extensions to the waterworks system at Vancouver, B.C., viz.: Steel mains, Thomas Piggott, of Glasgow, per W. Beverley Robinson, contract price \$59,939; cast iron pipe, A. J. Forsyth, Vancouver, contract price, \$29,491; pipe for main at Second Narrows, Evans, Coleman & Evans, Vancouver, contract price, \$44 per ton; 100 Ludlow hydrants, Robertson-Godson Company, Vancouver, contract price, \$40.50 each.

Public Buildings.

Lethbridge will have a large new opera house.

Dryden, Ont., is erecting a new Public School.

A new registry office will be built in Toronto.

Montreal will erect a new morgue to cost \$15,000.

A new school will be erected in Clan-deboyne, Ont.

Brandon is erecting a new fire hall, to cost \$4,370.

Lindsay is talking of erecting a new Collegiate Institute.

A new Lutheran chapel will be erected in Brantford.

The Salvation Army may build a hospital in Vancouver.

Montreal will build a new police station in St. Jean Baptiste Ward.

A 4,000 addition has just been added to the Havelock Public School.

A palm house will be erected in Allan Gardens, Toronto, to cost \$30,000.

The dome on the city hall, Kingston, is being replaced, at a cost of \$12,000.

The Methodists of Meaford have completed the erection of a fine new church.

Plans for the new Lutheran church to be erected in Brantford have been completed.

Work has been commenced on the erection of a new post office in Prince Rupert.

The Roman Catholic congregation of Ste. Angele, Que., will build a \$30,000 stone church.

The main exhibition building at Colingwood was recently destroyed by fire. Loss, \$8,000.

A by-law to raise \$20,000 for a nurses' home will be submitted to the ratepayers of Hamilton in January.

The congregation of St. Thomas D'Aquinas Church, Montreal, is erecting a new pressed brick edifice.

Work has begun on the new Young Women's Christian Guild building, Toronto. The structure will cost \$20,000.

The congregation of Christ Church, Deer Park, Toronto, will erect an edifice of stone and brick to cost \$35,000.

The G.T.P. are building a fine new depot at Watrous, Sask., which will be one of the divisional points on the new line.

The contract for the Emerson, Man., post office has been awarded, and work is to be proceeded with early next spring.

Chicago and St. Louis capitalists will erect a handsome hotel in Kingston, providing they receive a bonus of \$100,000 and a free site.

A by-law to raise \$8,000 for the enlargement of Lakefield public school has been approved of by the Ontario Railway and Municipal Board.

A consumptive hospital will be erected in Brantford next year. A free site has been secured near the House of Refuge and the Provincial Government will make a grant of \$4,000.

General Building Notes.

The Empire hotel, Saskatoon, will build a large addition.

S. J. Douglas is erecting five cottages in Vancouver to cost \$6,300.

A block of six stores will be erected in Peterboro by J. J. Lundy.

Alsip & Patterson will erect a brick department block in Winnipeg.

L. Lewis will erect an apartment block in Winnipeg to cost \$100,000.

New dwellings to the number of 370 have been put up in Victoria this year.

The building permits in St. Thomas are fully 70 per cent. ahead of last year.

Jacob A. Jacobs will build a fine block of stores on St. Catherine Street, Montreal.

Dr. Riggs and S. Salmon are erecting a brick office building in Vancouver to cost \$40,000.

Fred. Baylis will build a frame store and apartment dwelling in Vancouver to cost \$7,000.

In London during November 42 building permits were issued with a total value of \$76,790.

Building has been very active at Victoria, B.C. The outlay this year has been over \$1,000,000.

A fine large office building will be erected in the central part of Hamilton by P. D. Crerar, K.C.

The contract has been let for the biggest skating rink in British Columbia at Nelson. It will cost \$15,000.

The total value of building permits for London so far this year total \$756,000. The number of permits issued is 220.

A fine parsonage has been erected for the Hope Methodist Church, East Toronto, to perpetuate the memory of the late Walter E. H. Massey.

The new Grand Theatre, Winnipeg, recently collapsed covering the sidewalk with debris. The structure was just being completed at a cost of \$30,000.

The aggregate value of building operations in Barrie for the year approximate \$130,000. This is only \$20,000 below the figures for 1907, when church buildings, church improvements and the Y.M.C.A. were alone responsible for \$46,000.

Recent building permits in Toronto include: J. Gibson, pair dwellings, \$4,500; J. H. McNight, dwelling, \$5,000; E. G. Long, pair dwellings, \$7,800; Mrs. A. Macdougall, dwelling, \$5,000; T. N. Miller, store and dwelling, \$6,500; F. J. Male, dwelling, \$3,500; J. T. Colley, two dwellings, \$5,000; M. A. White, dwelling, \$6,000; Rev. G. Jackson, dwelling, \$7,000; W. G. Learmont, store, \$4,000; Will J. White, pair dwellings, \$9,000; F. W. Christie, two-storey dwelling, \$4,000; Board of Education, addition to Howard Park Avenue school, \$13,988; Miss H. Sheppard, apartment house, \$9,000; P. L. Slayer, store, \$5,000; E. Taylor, dwelling, \$4,000.

During the month of November there were issued in Toronto 412 building permits, valued at \$1,379,649, as compared with 201 permits valued at \$638,150 during the corresponding month last year. The number of new buildings erected in the city since the first of the present year are 4,990, as compared with 4,898 for the same period in 1907. The approximate value of all structures last year for the first eleven months was \$13,618,785, and this year the figures stand at \$11,740,062. The record for November is more than double that of the previous year, and at the close of 1908 it is expected the showing will not fall far short of the big figures of last year.

Among recent building permits in Toronto are: Mrs. M. McKay, pair dwellings, \$5,000; C. H. Mortimer, dwelling, \$5,000; G. F. McFarlan, dwelling, \$6,800; Thomas Mellwain, dwelling, \$5,000; M. S. Grimshaw, store and dwelling, \$4,000; F. S. Mearns, dwelling, \$5,000; E. A. Simpson, pair dwellings, \$4,000; Robert Loeke, 3 pair and 1 detached dwellings, \$17,500; W. Robertson, pair brick dwell-

ings, \$4,000; E. Elliott, 2 pair dwellings, \$7,000; J. Gibson, pair dwellings \$4,500; J. H. McNight, dwelling, \$5,000; E. G. Long, pair dwellings, \$7,800; Alan Macdougall, dwelling, \$5,000; T. N. Miller, store and dwelling, \$6,500; J. T. Corley, 2 dwellings, \$5,000; M. A. White, dwelling, \$6,000; Rev. G. Jackson, dwelling, \$7,000; McLaughlin Carriage Factory and warehouse, \$4,500; Mrs. I. Standish, dwelling, \$9,000; S. R. Comba, dwelling, \$5,000; F. Francis, pair dwellings, \$4,000; W. G. Learmont, store, \$4,000; W. J. White, 2 pair dwellings, \$9,000.

Municipal Undertakings.

A by-law to raise \$15,000 for street improvements will be submitted to the ratepayers of Almonte.

It has been decided to submit a by-law in January next in Hamilton to raise \$65,000 for sewer extensions and \$300,000 for good roads.

Peterborough ratepayers will vote on a by-law to expend \$50,000 for the erection of a new bridge across the Otonabee River at Smith Street.

Pembroke Council may submit a by-law to the electors to either instal a new intake pipe at a cost of \$50,000 or to have slow sand filtering at a cost of \$90,000.

A by-law to raise \$6,000 by debentures for the erection and equipment of public swimming baths in London will be submitted to the ratepayers on January 4.

A new water system is being installed by the G.T.P. in Prince Rupert, as the old mains were found to be too small. A reservoir of 50,000 gallons is being erected back of the town.

Owing to the scarcity of water, Fort William has asked the Ontario Government to give the Kaministiquia Power Co., which has a concession at Kakabeka Falls, permission to conserve the waters of several streams running into the Kaministiquia River.

At the London municipal elections in January the ratepayers will probably vote on a by-law to raise \$441,000 to carry out a scheme of the Water Commissioners for the increase of the water supply. The plan includes the taking in of the Kilworth supply at a cost of \$125,000. It is proposed to erect a pumping station in the north end of the city.

John McDougall & Co., Montreal, who have built a Worthington pump for the City of Montreal, are entitled to a bonus of \$5,000. The contract provides for a capacity of 12,000,000 gallons per 24 hours, and a duty, or efficiency guarantee of 160,000,000 foot pounds per 1,000 pounds of steam consumed, the city to pay a bonus to the company of \$1,000 for each million

duty developed over the 160 millions, the bonus to be limited to \$5,000. The recent official test showed the duty developed by the pump to be over 175,000,000, the company thus fairly earning their bonus.

THE NEWEST SKIN GAME.

"I have always acted on my own judgment after sizing a man up," said a Montreal brass goods traveler who has a reputation as a good sport. "For 20 years I have believed that I could tell a rascal or an honest man on sight, but something happened the other day to make me doubt myself. I was loafing around the depot, waiting for my train to go, when a man approached me and started a conversation. We were talking away when a second man came sneaking up and told a hard luck story, and asked to be helped out of a hole. After one look at him I was satisfied that he was a skin, and turned my back on him. Not so with the other man, however. He seemed interested and impressed, and finally gave the fellow a \$5 bill to go and get changed, promising him a quarter when he returned.

"That's the last of your money," I said as the hard luck man disappeared.

"No; I think he will come back," was the reply. "He looked to me like an honest man."

"And to me like a deadbeat. Consider yourself \$5 out of pocket."

"I can hardly do that. Something tells me that I am not mistaken in that man."

"Perhaps you'd like to bet another five that he will show up again?"

"To my surprise he said he did, and we found a stakeholder and put up the coin."

"And what happened?" was asked as the drummer paused.

"Why, the hard luck man came back with the change."

"He did!"

"As straight as a string, and was given the promised quarter; I lost my five, of course."

"And—and——"

"And a little later on the depot policeman told me that they were pals working together, and that they skinned half a dozen suckers at the game every day in the year."

"But you—you are a drummer."

"Just so; but it's my business to sell valves and not look for gum games. When you want a soft mark look for a drummer."

The International Heating and Lighting Co., whose franchises in Edmonton and Stratheona for the sale of artificial gas are lapsing has asked for a revival of their franchise in Edmonton.

PLUMBING AND HEATING MARKETS

MONTREAL.

December 11.—Trade has assumed a much quieter tone. Some fair sized orders have gone through, but with building activity nearing its close lines such as soil pipe are practically dead. There is plenty of finishing work still to be done so lead pipe, enamelware, and heating goods are still showing steady movement. The trade, however, has now entered upon its quiet time, and until building starts again plumbers will have to make themselves busy over jobbing work. Manufacturers have received some heavy orders for next spring delivery, and there is every reason to believe that most factories will be busy during the winter on contracts in hand. Prospects are undoubtedly more favorable than they were this time last year. Architects are uniformly busy, and if only one-half of the plans mature next year should be a banner one for the building and allied trades. Prices are unchanged, the markets generally being firm. We hear, however, of one or two cases of unnecessary cutting.

IRON PIPE—Business is quiet, with supplies in good shape. There is no change in prices, and we quote: $\frac{1}{2}$ -in. black, \$2.63; galvanized, \$3.48; 1-in. black, \$5.11; galvanized, \$6.76. Malleable and cast iron fittings are in fair demand at unchanged prices.

SOIL PIPE—Now that foundation work has been stopped there is little doing in soil pipe. The market will be dead until next spring. We continue to quote: Light, 3 to 6 in., 60 off; medium to heavy, 2 to 6 in., 70 off; 8 in., heavy, 40 off.

LEAD PIPE—Pipe is still going out steadily. There seems to be a greater disposition to stock up among the plumbers, probably due to the recent advance. We continue to quote pipe and waste at 27 $\frac{1}{2}$ off. Traps and bends at 50; calking lead at 5c per pound.

SOLDER—Solder is on the quiet side and with no change in prices. Supplies are in good condition. We quote 19 $\frac{1}{2}$ c for half and half and 18 $\frac{1}{2}$ c for wiping.

ENAMELWARE—Fair orders are being placed with the jobbers, although the demand is not so good as it was. Manufacturers are receiving good contracts for spring delivery and busy times seem to be in store for the factories. List prices are maintained although we hear of some cutting going on.

BRASS GOODS—Business is inclined to be dull. Prices on the better class goods are firming, although no very great alteration has yet been made. Standard compression work and fuller work are unchanged.

RADIATORS AND BOILERS—Good trade is still being done in these lines and the season is keeping up splendidly. There is no change in the published lists. We quote: Radiators at 52 $\frac{1}{2}$ and boilers at 50 and 10 off. Steam fittings are 66 2-3 off.

METALS—Metals are not so strong as they were, although only tin shows alteration in price. We quote: Ingot copper, \$15.50; ingot tin, \$33; lead, \$3.80; pig iron, Middlesboro No. 1, \$18.50 to \$19; Summerlee, \$20. Heavy scrap red brass is 10 $\frac{1}{2}$ c; light copper, 10 $\frac{1}{2}$ c; heavy lead, 2 $\frac{1}{2}$ c.

TORONTO.

Toronto, Dec. 12.—Business in the plumbing line moves along in fairly good shape and about the same volume is being done as last year. The prospects are, however, brighter and plumbers will be kept fairly busy, several having secured many orders ahead. In iron pipe there is lots doing and in brass goods there have been moderate sales owing to numerous service pipes being put in. There are practically no changes in prices. The new list in enamelware which should have gone into effect four weeks ago, is not yet in service and will not be, in most establishments, until the new year. New price lists are likely to go into effect in some other lines such as brass goods, iron pipe, etc., about the first of January. Certain firms are now preparing fresh lists, while others declare that until there is a firmer market and prices are more regular they will not go to the expense of getting out and distributing revised lists.

BRASS GOODS—There is complaint still of some cutting in the cheaper grades. A fair business is being done, although the rush has not been great nor the demand heavy. There are some slight changes in discounts and the following figures generally prevail. Standard compression work, 10 per cent.; fuller work, 7.5 per cent.; flatway stop and waste cocks are 65 to 75 per cent., while round way are now 70. Compression bath cocks (No. 4) are quoted at \$1.50 to \$1.60, and No. 4 $\frac{1}{2}$ Fuller's, \$1.85 up. Fuller bibs are 75 and 15.

ENAMELWARE—The trade is fair and the prospects splendid. The fall building activity should create a big demand. The new discounts of thirty in some lines and thirty and five in other lines will not go into effect generally until the first of the year. In most instances old lists are being used and old discounts prevail for two weeks longer.

IRON PIPE—The market is firm and a fine business is being done. The price-

cutting campaign indulged in by some houses a few weeks ago, when business was rather dull, appears to have vanished, and there is now an even steady volume of trade. The figures stand: 1-in. black, \$5.11, and 1-in. galvanized, \$6.76. Cast iron fittings, 70 per cent.; flanged unions, 60; nipples, 70 and 10; malleable lipped unions, 55. Malleable fittings are unchanged at from 37 $\frac{1}{2}$ per cent.

SOIL PIPE—There is no change in quotations, which are: Light pipe, 60; fittings, 70 per cent. Medium and extra heavy pipe and fittings are 70 per cent.

LEAD PIPE—There is a good demand as numerous dwellings are being finished up on the inside. Calking lead is from 4 $\frac{1}{2}$ to 5c per lb.; traps and bends, 50; pipe and waste, 27 $\frac{1}{2}$ off.

SOLDER—The market is strong in the raw materials, but no advance is made locally in prices, which stand at 18 $\frac{1}{2}$ c per lb. for wiping solder, and 19c for half and half. There is a fair demand.

BOILERS AND RADIATORS—There is more doing in the line of boilers just now than in radiators. Some temporary work is being done in order that plastering may be proceeded with in new houses and interior work carried to completion. There are better prospects for the business all around than at this time last year. Prices remain unchanged.

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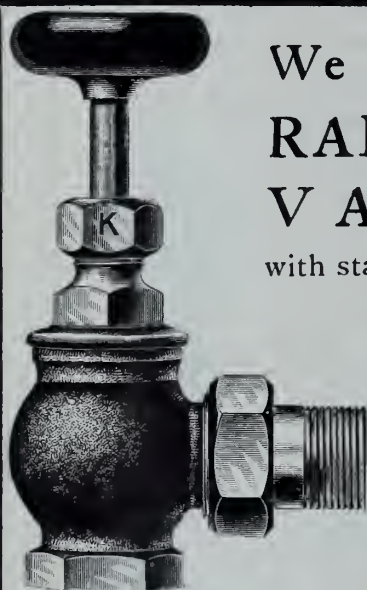
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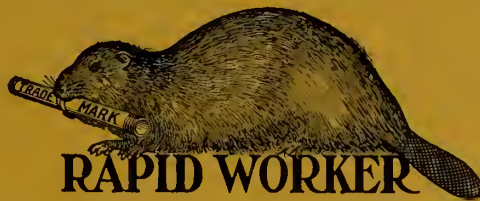
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